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# THE Bengal Kindergarten.

[ INTENDED AS A COMPLETE MANUAL FOR TEACHERS OF  
INFANT CLASSES AND OF STANDARDS I AND II. ]

BY

KALI PADA BASU, M.A.,

*Professor of Mathematics, Dacca College ; Author of Algebra  
Made Easy, Vols. I & II ; Shishuranjan Patiganita,  
Parts I, II, III & IV, &c.*

CALCUTTA:

S. C. BASU,  
65, COLLEGE STREET.

1st. January, 1902

DAVID PHARE TRAINING COLLEGE,

College Sq. Calcutta.



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PRINTED BY K. C. BASU, AT THE SAKHA PRESS,  
34, MUSSULMANPARAH LANE, CALCUTTA.

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PREFACE.

The present work is intended as a complete manual for teachers in charge of Infant classes, and of Standards I and II of the new scheme of Vernacular Education. It has been written out in strict accordance with the Syllabus of studies for those classes, published in the Calcutta Gazette of the 2nd January 1901. It was originally written in Bengali, and the present is almost a literal translation of it, with such additions and alterations only as were deemed necessary for a satisfactory rendering of Bengali ideas and thoughts into English. I have endeavoured in this little book to popularise the principles of the Kindergarten method of teaching among my countrymen, in a way best suited to the capacities of our children, and with the help of such apparatus as are of the simplest nature and available at a little or no cost in almost every little village of Bengal. The following are some of the special features of the book :—

(i) In order that the class of teachers for whom the book is meant, may understand their business *without any external help*, a model lesson has been given on every one of the subjects mentioned in the Syllabus, excepting only such as are to be taught by the aid of text-books.

(ii) Lessons have been copiously illustrated by diagrams and pictures.

(iii) The present system of teaching Arithmetic in our schools is defective. Accordingly, an earnest endeavour has been made to illustrate fully how the elements of this subject should be presented to beginners.

(iv) Both in the exposition of principles and in the advice given to teachers, verbosity has been carefully avoided to ensure *impressiveness*.

Any corrections or suggestions for the improvement of the work will be thankfully received.

Dacca : September, 1902.

K. P. BASU.



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# THE Bengal Kindergarten.

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## CHAPTER I.

### *Principles of the Kindergarten Method of training young Children.*

If we study child-life, the following facts cannot but strike us :—

1. Even a new-born babe would **not lie still**. It begins to move its hands and feet from the very moment of its birth. This **love of activity** is the primary cause of its physical growth. At first, the limbs are very feeble, but constant movement to which they are subjected makes them stronger day by day. The child thus acquires the power of turning on its sides and then of moving on its breast. The physical exercise continues with increasing vigour, and the child at the next stage begins to move on its hands and knees. How sprightly does the child become when it finds itself able so to move ! Thus as the child grows in age, it acquires greater and greater power of movement, and along with it greater and greater love of activity. This is child-nature, and whatever interferes with it is sure to weaken the child and stunt the development of its physical powers.

2. The child begins to acquire knowledge from the very moment of its birth. The eyes, the hands, the ears, the tongue—all help in the gaining of knowledge. Hold a beautiful thing before the child ; how attentively does it look at it



and tries to get possession of it ! Ring a bell or otherwise make a sound ; how carefully does the child listen ! If it succeeds in getting hold of a thing, instantly does the child put it into its mouth and begin to taste it.

3. As the child advances in age, its **desire** and the consequent **effort** for the acquisition of knowledge **gradually increase**. If the child hears you speak, it looks at your face and gives an open-mouthed attention to your words. Hold a looking glass before the child ; it will immediately try to see who is there on the other side of it. This is how the child exercises its powers of observation.

4. It is by **observation** alone that the child learns to speak. The child hears you utter the word "water", it sees with its eyes what you mean by the word, it handles the thing, it constantly observes what use is made of the thing ; thus through ears, through eyes, through hands, the child ultimately acquires a complete knowledge of water. The child hears "I will eat rice" ; it observes what you mean by rice, and what you do when you say so ; thus the child is led by gradual steps to say "I will eat rice" when it becomes hungry. Observation is but another name for the combined exercise of the powers of seeing, hearing, handling, etc. It is clear therefore that all the knowledge that the child acquires from its very infancy is acquired **through observation**. Just think of the power of speaking that a child of three years possesses. How has it acquired this power ? Just think for a moment how the child constantly exercises its faculty of observation !

5. The child takes a great delight in the exercise of its powers of observation. When it has learnt what is meant by "red", if it succeeds in finding out a red thing out of a group of many, just imagine its delight ! Instantly does it run to mamma to make the fact of this discovery known to her ; and nothing short of this would please the child.

6. The child has a **natural craving for knowledge**. How eager is it to know what is this and what is that ! Who has not observed the eager questioning of an intelligent child ? It is at times difficult even for an adult to answer all such questions.

7. The child is as eager to acquire knowledge as it is to **put the acquired knowledge into practice**. The child sees its father writing, observes his posture, how he holds the paper, how he holds the pen ; this observation being repeated day after day, a clear idea of the act of writing becomes fixed in the child's mind. It strives then to put this idea into practice—takes the pen, inkstand and paper and begins to scrawl ; and this gives it a great pleasure. Most of what we call child's play are **nothing but acts of this kind**. Clearly therefore the play of a child is **not meaningless**, it is but another name for the endeavour that the child makes to put its acquired knowledge into practice.

From the foregoing brief survey of child-character it is quite clear that both for the physical and the mental development of the child **Nature has provided wonderful laws**. Any system of training which runs counter to these natural laws must inevitably defeat its own object, and should therefore be deprecated by all means. The system of primary education that at present obtains in this country is a system of this kind. The child is forced to sit still in the same place for a long time, which seriously hampers the development of the body. Knowledge is presented to him in a most unattractive and unnatural form, and the only use that the child makes of that knowledge is to commit it to memory like a parrot ; such a course not only <sup>is</sup> <sup>breaks</sup> <sup>is</sup> <sup>the</sup> <sup>only</sup> <sup>use</sup> <sup>that</sup> <sup>the</sup> <sup>child</sup> <sup>makes</sup> <sup>of</sup> <sup>that</sup> <sup>knowledge</sup> <sup>is</sup> <sup>to</sup> <sup>commit</sup> <sup>it</sup> <sup>to</sup> <sup>memory</sup> <sup>like</sup> <sup>a</sup> <sup>parrot</sup> ; such a course not only interferes <sup>not</sup> <sup>seriously</sup> <sup>with</sup> <sup>the</sup> <sup>proper</sup> <sup>development</sup> <sup>of</sup> <sup>the</sup> <sup>child's</sup> <sup>mental</sup> <sup>faculties</sup>, but serves also to create in his mind in most cases a strong aversion for the subjects thus presented.



The Kindergarten Method is free from the defects noticed above. It aims at working in harmony with the laws of Nature. The child is fond of movement; very well, do not deprive him of this pleasure, but see that the movement is orderly and wholesome. The child finds pleasure in acquiring knowledge through his own eyes, ears and hands; deprive him not of this pleasure, but help him by all means. The child loves play; let him play, but devise such plays as would materially help in the gradual unfolding of his latent powers.

In the system of education now in vogue, of the many faculties that the child possesses, it is the memory alone that is exercised, and exercised rather unduly. The faculties of observation, reasoning, judgment, imagination, and attention, as also the power of expression find no scope for development. The Kindergarten system has provisions for all these. With the child, the power of attention has no better field for culture than play; there is therefore an ample provision for play in the new system. The powers of observation, reasoning and of expressing thought in language, are best exercised and developed by object-lessons, and it is the object-lesson teaching that forms a most prominent feature of this system. Provision also has been made for the teaching of drawing, which is well calculated to awaken in the child his powers of imagination and originality. Considering all these, it might be asserted with perfect truth that the system now sought to be introduced for the training of our young children is the most natural and scientific method that could possibly be devised for the purpose.

The greater the stock of knowledge that the child acquires by direct observation, the better and sounder will be the foundation for further acquisition of knowledge. Let us illustrate this by an example. The child comes to his father



and asks "Pappa, what is meant by *unexpectedly*"? "Suddenly" is the reply. This reply may silence the child, but unless he has already become familiar, by direct observation, with the real import of the word "Suddenly", just in the same way as he has become familiar with the words "rice", "fish", "badly", etc. the Pappa's reply would be no more intelligible to the child than the exposition of the principles of the Calculus to a savage. How useful then is the method of teaching in which there is ample scope for the proper culture of the child's power of direct observation!

Object-lessons are not intended as a means for imparting so much book knowledge. This is entirely beside the mark. The child is to be shewn the right way of making the **best use of his own senses**. The child should be made to feel the **delight** consequent upon every successful exercise of his own powers. The child's **curiosity** for knowledge should be **excited**, and he should be **encouraged to make discoveries** for himself by the right use of the methods presented to him. These are the principal lines on which the teaching of object lessons should be conducted, and they have always been kept in view in writing out the object-lessons given in Chapters V—IX of this book. The child is to be made to express its ideas and thoughts by endeavouring to answer correctly a series of short and simple questions. If the child fails to answer any question, the teacher should not give out the answer at once, but make the child's thoughts **gradually drift** towards the required answer by putting to him a further series of shorter and simpler questions. It is only in cases of exceptional difficulties that the teacher himself should give the answers. The kind of answers given in this book is such as can be expected from a child of average intelligence. This method of **questions and answers** is the only right method of teaching the child to express his thoughts in correct language.

The Kindergarten System has also in view the **moral teaching** of the child.

Lessons on obedience, honesty, truthfulness, courtesy, fellow-feeling, kindness to animals, and the like, should be occasionally inculcated upon the child.

The evils of an absence of these qualities should also be brought home to the mind of the child by such examples as fall within the range of his **direct observation**.

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## CHAPTER II.

### *The Kindergarten occupations and Action Songs.*

The child is fond of play. Let him have it. But let the play be so organised that it may be the indirect means for the physical and mental advancement of the child. The Kindergarten occupations and action songs are but an embodiment of this principle. They may therefore be rightly interpreted as **organised play**. Four different kinds of occupations only will be illustrated in this book—those of seed placing, stick laying, drawing and seed work.

1. **Seed placing.** Let the child have a number of tamarind seeds. By means of a piece of chalk draw a straight line on his working-table and instruct him to arrange the seeds along this line. Then draw a curved line and ask him to arrange seeds along it. Then draw a crooked line, then a circle, and so on, each time asking the child to arrange seeds along the line or figure drawn. Too much however should not be attempted at a time. As soon as the child's attention is found to flag, he should be taken to some other work. The forms of the lines and figures on



which the child arranges seeds will be gradually fixed in his mind; and he will at last be able to produce imitations of such lines and figures by the mere juxtaposition of seeds. Beginning with a straight line, the following lines and figures should be successively presented to the pupil:—a lying-down line, a standing-up line, a right angle, different kinds of curved lines, a circle, an ellipse, a triangle, and a quadrilateral. After the child has become thoroughly familiar with these forms he should be trained to write the numerals in the manner exemplified in Lesson XXIII, Chapter V, of this book.

**2. Stick laying.** Bamboo sticks of the thickness of a match or of the mid-rib of a cocoanut leaf-let will be required. Let each stick be of the same size, say three inches in length, and let there be 30 or 40 such sticks in a bundle. Each pupil is to be supplied with one such bundle and the teacher himself should have one. First of all the child is to be taught the various ways in which two sticks may be placed—parallel in a lying-down position, parallel in a standing-up position, one lying down and the other standing up, forming a capital *tee*, a capital *tee* reversed, a *vee* (opening upwards, downwards, towards the right, towards the left), and so on. Once shewn the way the children will help themselves with the greatest delight. After the children have become thoroughly familiar with the two-stick-forms, the teacher should present to them some of the three-stick-forms in the manner indicated in Lesson XX, Chapter V, of this book. The child's progress must be gradual and in no case should his interest in the play be allowed to flag.

**3. Drawing and seed work.** The rudiments of these subjects will be found illustrated in Lessons XII and XIV, Chapter V; in Lessons XXIV and XXV, Chapter VI; and in Lesson XXVI, Chapter VII. It is not therefore necessary to say anything more about them here.



The children should be made to feel that these occupations are nothing but different kinds of play. Regarded in this light the occupations will prove attractive, and hence admirably serve the ends for which they are contrived. Culture of attention, Hand and Eye training, a clear conception of different forms and figures, and a healthy exercise of the powers of imagination and originality, are some of the results that these occupations aim at.

4. **Action songs.** Songs and music are most amusing to children. They will, if they can, run to the place where songs are being sung or music is being played. Whatever they see or hear they try to imitate. If they attend the performance of a *Jatra* party, they will afterwards find pleasure in imitating the songs they heard or the acting they witnessed.

Clearly therefore singing and acting are most entertaining to children, and may therefore be turned to their greatest advantage if properly contrived. This is the principle of *action songs*. The songs should be composed in the simplest language and should contain information on scenes and objects interesting to children. Singing and acting must go hand in hand; the children whilst singing, will by various actions impart vividness to the song. Action songs will thus prove beneficial both to the physical and mental development of the child. A few songs of this kind are given in the last chapter of this book with the necessary directions for the actions.

*Note.* There are several other occupations besides those mentioned above, such as paper cutting, paper folding, mat weaving, clay modelling, bead threading, etc. These occupations are taught in most of the Kindergarten schools of England.

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## CHAPTER III.

### *The requirements of the Syllabus for the Infant and Lower Primary standards of Vernacular education.*

**The site of the School house.** The school house should be so situated that there may be an open space all round it, and it should face the south. In front of the house there should be a convenient space for a small garden. This garden will be the place where the students will have their lessons on practical Agriculture and Botany. There should be a sufficient number of flower plants in the garden yielding flowers of various colours. The garden should also contain such plants as would be required in giving lessons on Botany.

**The Play ground.** The site for the play ground should be in the shade of the school house, so that the effects of sun shine might be avoided. The children will, as a rule, have their exercises in Drill and action songs in the play ground ; but when the weather is rainy or otherwise unfair, arrangements for such exercises should be made within the school room.

**The School house and furniture.** The plan and dimensions of a school house capable of conveniently accommodating between 30 to 40 children will be given in the next chapter. The furniture will be as follows :—

(1) **A small mat**, measuring about three feet in length and a foot and a half in breadth, may be provided as the seat for each child.

(2) **A small table**, one and a half feet square and about six or seven inches in height, for each child. The table is to be placed on the fore part of the mat, the child sitting on the hind part ; and any apparatus with which the child may be temporarily provided, or his own books and slate etc, may very conveniently be put below the table. There should be a small hollow, about a quarter of an inch deep, cut out in the distant



right-hand corner of the table, for the purpose of accommodating an ink-stand whenever required.

(3) A chair, a stool, or a small table of the above size to be provided as the seat for the teacher. Besides this there should be 4 or 5 other seats of a similar kind to be occasionally used by the pupil teachers.

(4) Three black-boards, and two wooden boxes to hold the apparatus.

(5) A clock or a time-piece. Rupees two and a half or three will do for a middling time-piece. It is an indispensable article and no school, however poor, should be without it.

**Apparatus.** Writing materials, a black rule, a lead pencil, a pen knife, a needle and some thread, pieces of chalk, a box of paints, ten or twelve porcelain cups, brass scales and ordinary balance with counterpoises, a *dao*, earthen vessels of various kinds, and a brass *lotah* are about all the *general* ingredients of the apparatus. These things can be had almost everywhere and at a small cost. The articles necessary for the elucidation of any particular lesson are mentioned at the very beginning of that lesson, in Chapters V—IX. Of the articles so mentioned, those named above are some; the rest will be available at a nominal cost.

Many of these things again may be occasionally borrowed from the neighbouring households.

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## CHAPTER IV.

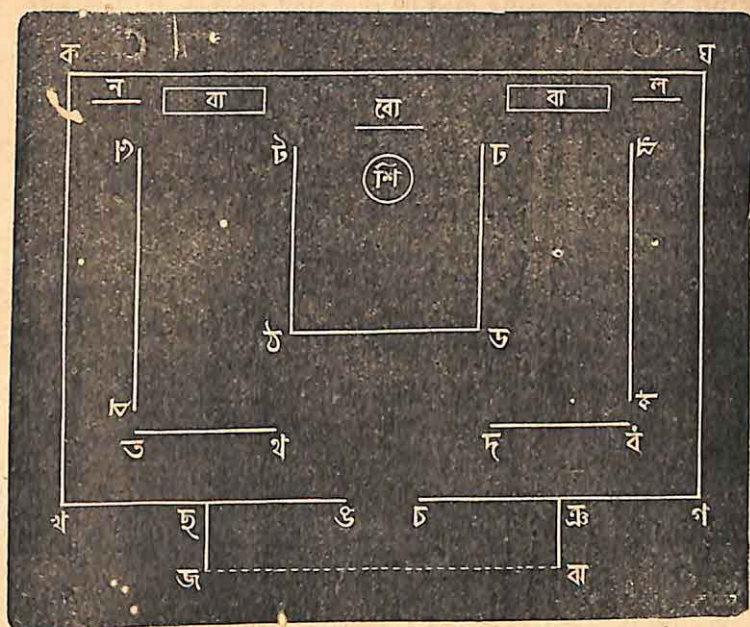
### *The school-room and arrangement of children.*

The school room should be sufficiently spacious. It should face the south and there should be an open verandah in the front.

There should be sufficient provision for the admission of light and air into the room. If convenient, there should be



verandahs also on the east and on the west. Occasionally the children of any class may be taken to the verandah for giving them instruction in particular lessons. The plan of an ordinary school-house is given below ; the arrangement of children and furniture also is shewn in the plan.



ক খ গ ঘ is the School house, ঙ চ is the doorway, and ছ জ ঝ ঞ is the verandah. The room measures twenty seven feet by eighteen. ঙ চ = 3 feet, জ ঝ = 15 feet ; ছ জ = 3 feet. ট ঠ ড ঢ marks the place where the children for standards I and II are to be seated. শি marks the seat of the teacher. ন ল প ফ mark respectively the places where the 1st and 2nd year infants are to be seated. ত থ and দ ধ are the lines along which the 3rd year infants are to be placed.

বা marks the place where a black board, measuring four feet by three, is to be permanently located. The board should

be mounted on a frame, and should be capable of turning on two vertical pivots fixed in the middle of the upper and lower sides of the frame. The teacher may at times work out sums on the back of the board, and may afterwards present the solution to the pupils by simply turning the board.

The *almirahs* or boxes containing the school apparatus are to be placed in the position marked “11”. “2” and “3” are the positions for two other black boards, portable and much smaller than the one previously mentioned. They may be taken before the infant classes whenever required, and afterwards replaced in those positions when the work is over.

The students of the two highest classes will be required to act as monitors during certain hours of the day. It will be impossible for the teacher to manage all the classes unless he is assisted by such monitors. The portions of the Science Reader and the sets of object-lessons prescribed respectively for standards I and II are easily interchangeable. Hence the same set of object-lessons and the same portion of the Science Reader can be taught to the 1st and 2nd classes together. The set of object-lessons and the portion of the Science Reader that the students of the 1st class did when they were in the 2nd class, may be done by the present 2nd class when they become the 1st. By this arrangement the teacher's time will be best economised, and the pupils too will get time for acting as monitors. A rough plan as to how the daily work of a Lower Primary School may be successfully managed by one teacher assisted by monitors, is given below. Numbers 1, 2, 3, 4, 5 stand for the 1st, 2nd, 3rd, 4th and 5th classes respectively, and these classes again correspond to standards II, I, and Infant stages III, II, I, respectively. The whole period of five hours has been divided into seven intervals, the six first intervals being three quarters of an hour each, and the last, only half an hour.



1st. interval (45 minutes)	2nd. interval (45 minutes)	3rd. interval (45 minutes)	4th. interval (45 minutes)
<ol style="list-style-type: none"> <li>1. Arithmetic and dictation*</li> <li>2. Monitorial work</li> <li>3. Writing</li> <li>4. Seed placing</li> </ol>	<ol style="list-style-type: none"> <li>1. Object Lessons } and }</li> <li>2. Science Primer }</li> <li>3. Left to themselves }</li> <li>4. playing with seeds }</li> </ol>	<ol style="list-style-type: none"> <li>1. Monitorial work</li> <li>2. Arithmetic and Dictation *</li> <li>3. Reading and drawing</li> <li>4. Reading and stick laying</li> </ol>	<ol style="list-style-type: none"> <li>1. Writing and Drawing</li> <li>2. Monitorial work</li> <li>3. Object Lessons &amp; Arithmetic*</li> <li>4. Exercises in the play ground (Recitation of Arithmetical tables and action songs)</li> <li>5. Stick laying</li> </ol>
<ol style="list-style-type: none"> <li>5. Drawing and seed placing</li> </ol>	<ol style="list-style-type: none"> <li>5. and sticks</li> </ol>	<ol style="list-style-type: none"> <li>5. Exercises in the play-ground (action songs).</li> </ol>	

5th. interval (45 minutes)	6th. interval (45 minutes)	7th. interval (30 minutes)
<ol style="list-style-type: none"> <li>1. Monitorial Work</li> <li>2. Writing and Drawing</li> <li>3. Exercises in the play ground (Recitation of Arithmetical tables and action songs)</li> <li>4. Object-lessons and Arithmetic *</li> <li>5. Arithmetic and the writing of numerals</li> </ol>	<ol style="list-style-type: none"> <li>1. Monitorial work or independent exercises in different subjects</li> <li>2. Ditto</li> <li>3. Arithmetic and seed work, etc.</li> <li>4. Writing and Drawing</li> <li>5. Object-lessons *</li> </ol>	<ol style="list-style-type: none"> <li>1. } Drill *</li> <li>2. }</li> </ol>

The subjects marked with an asterisk are to be taught by the teacher himself ; the rest may be left to monitors. The routine given above may be followed on each of the five days from Monday to Friday ; on Saturdays the last interval may be dropped and the length of each of the other intervals reduced to half an hour.

The teacher should always occupy the position assigned to him. The infant classes will come over to him whenever required, an equal number of students from the 1st and 2nd classes occupying the seats vacated by the infants. By this arrangement the teacher will be able to exercise a constant supervision over all his pupils.

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## CHAPTER V.

*The training of Infants—Stage I.*

### LESSON I.

*(On Parts of the Human Body.)*

**Apparatus :** A piece of rope about one cubit long.

*Teacher*—What do you find in this picture ?



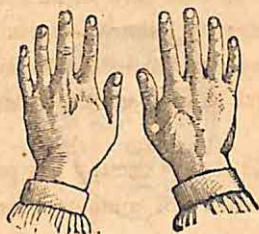
*Pupil*—A man's hand.

*Teacher*—How many hands ?

*Pupil*—One.



*Teacher*—How many hands this time ?



*Pupil*—Two.

*Teacher*—Ram, put your hands on this table. Gapal, hold this rope with your hands and stretch it. Kedar, take your hands towards your back.

*Teacher*—What is this the picture of ?



*Pupil*—A man's feet.

*Teacher*—How many feet ?

*Pupil*—Two.

*Teacher*—What have you on your feet ?

*Pupil*—Shoes.

*Teacher*—Ram, stand up. If you had no feet ?

*Ram*—I could not stand up.

*Teacher*—Kedar, walk from here to there. If you had no feet ?

*Kedar*—I could not walk.

*Teacher*—What do you find in this picture ?



*Pupil*—A man's Head.

*Teacher*—Cover your head with this *Chadar*, will you ?

*Teacher*—( Nodding his head ) What am I doing ?

*Pupil*—You are nodding your head.

*Teacher*—( Holding his own neck by the hands ) Do you know what is this below the head ? It is the *neck*. Ram, will you coil this *Chadar* round your neck ? Gopal, Kedar, Hari, you all do the same.

*Teacher*—What part of the body is above the neck ?

*Pupils*—The Head.

*Teacher*—What part is below the Head ?

*Pupil*—The neck.

## LESSON II.

(On Colour.)

**Apparatus :** An inkstand with ink, a piece of chalk, and a piece of white paper.

*Teacher*—( Holding his own hair by the hand ) What have I held by the hand ?

*Pupil*—Hair.

*Teacher*—Can you say what is the colour of the hair ?

*Pupil*—Black.

*Teacher*—Quite so. What other things do you find in this room whose colour is black ?



*Pupil*—The black-board, the black ink.

*Teacher*—( Holding a piece of chalk ) What is this in my hand ?

*Pupil*—A piece of chalk.

*Teacher*—Of what colour is it ?

*Pupil*—White.

*Teacher*—What other things of the same colour do you find in this room ?

*Pupil*—White cloth, white paper.

*Teacher*—Very good. You have learnt today what is meant by black and what is meant by white. From this day forth, of all the things that you may see, you must try to find out which are black and which white. You will have to tell me afterwards the results of your discovery.

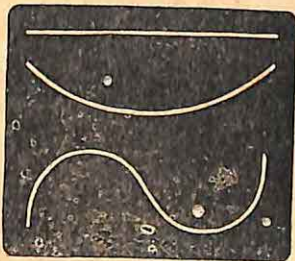
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### LESSON III.

(*On Form.*)

**Apparatus :** A piece of rope about one cubit long, a slate and a pencil, an umbrella, and a sheet of paper.

*Teacher*—( Drawing three lines of the following kinds on the board ) Are these three lines of the same nature ?



*Pupil*—No.

*Teacher*—How does each of them look ?

*Pupil*—(Going to the board and shewing by the finger) This line is straight, this one is bent, this one is bent once in this way and once in that.

*Teacher*—Very true. (Shewing by the hand) This line is called a *straight line*, this line is called a *curved line*, and this line is called a *crooked line*. Tell me now, my boy, which is which ?

*Pupil*—(Shewing by the hand) This is a straight line, this is a curved line, and this is a crooked line.

*Teacher*—Very good. (Stretching the rope with his hands) What does this rope look like ?

*Pupil*—Like a straight line.

*Teacher*—(Slacking the rope) What does it look like *now* ?

*Pupil*—Like a curved line.

*Teacher*—(Putting the rope in the form of a crooked line either on the ground or on the table) What does it look like *now* ?

*Pupil*—Like a crooked line.

*Teacher*—(Drawing promiscuously a number of straight, curved and crooked lines on the slate) Find out which of these lines are straight, which are curved and which are crooked.

*Teacher*—What does this part of the edge of the umbrella look like ?

*Pupil*—Like a curved line.

*Teacher*—What does this edge of this piece of paper look like ?

*Pupil*—Like a straight line.

**Note.** Of the various things that may be found in the room the teacher is to hold one at a time before the pupils and ask them to say which line any particular edge of the thing resembles.



## LESSON IV.

*(On Form.)*

**Apparatus:** An earthen ball, a pice, and an iron ring or a thing of that kind.

*Teacher*—(Holding the ball) Look at this *ball*. Do you know of what is it made?

*Pupil*—It is made of clay.

*Teacher*—What do they call it?

*Pupil*—A ball.

*Teacher*—(Holding the pice) Do you know what is this?

*Pupil*—It is a pice.

*Teacher*—What is its form?

*Pupil*—Round.

*Teacher*—What is the form of the ball?

*Pupil*—Round.

*Teacher*—(Putting the pice and the ball on the table) This is round and that also is round. Are the two things then of the same form?

*Pupil*—No.

*Teacher*—What is then the difference between them?

*Pupil*—(Shewing the pice) This is flat. (Shewing the ball) This is not flat and it is round on all sides.

*Teacher*—Quite so. (Shewing the ring) Which does it resemble more, the pice or the ball?

*Pupil*—The pice.

*Teacher*—How does it differ from the pice?

*Pupil*—The ring is hollow, which the pice is not.

*Teacher*—Good. From this time whenever you happen to see a round thing you must try to find out whether it resembles a ball, a pice or a ring.

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## LESSON V.

(*On things Hard and Soft.*)

**Apparatus:** A ball of baked clay, a soft ball of rags, and a number of mud balls.

*Teacher*—(Shewing the ball of clay) What is this?

*Pupil*—A ball.

*Teacher*—Of what is it made?

*Pupil*—It is made of clay.

*Teacher*—(Shewing the ball made of rags) What is *this* ball made of?

*Pupil*—It is made of rags.

*Teacher*—Very well, hold these two balls in your two hands and squeeze them. Which is the easier to squeeze?

*Pupil*—(Shewing the ball of rags) This one.

*Teacher*—The clay ball is *hard*, so you feel pain when you try to squeeze it. The ball of rags is *soft*, so you can squeeze it easily. Now tell me, my boy, which ball is what.

*Pupil*—(Shewing the clay ball) This is hard. (Shewing the ball of rags) This is soft.

*Teacher*—Very good. Try your fingers on the skate, on this pencil, on this table; will you? How do they feel?

*Pupil*—Hard.

*Teacher*—(Giving a mud ball to each pupil) Try this ball now.

*Pupil*—It is soft.

*Teacher*—Will you try this part of your hand (shewing the fleshy part)?

*Pupil*—It is soft.

*Teacher*—(Shewing the wrist) Feel this part of your body now.

*Pupil*—It is hard.



*Teacher*—Yes. The body is made of bones and flesh. The bone is hard and the flesh is soft. At first you tried the flesh, and it felt soft; then you tried the bone, and it felt hard.

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## LESSON VI.

*(On things Rough and Smooth.)*

**Apparatus:** A chip from a blanket or a gunny, and a bit of rough plank.

*Teacher*—(Shewing the chip) What is this, can you say?

*Pupil*—It is a blanket chip.

*Teacher*—I spread it over this table. Will you pass your fingers over it? Will you now pass your fingers over the slate? Which is it easier to pass your fingers over?

*Pupil*—The slate.

*Teacher*—The surface of the slate is *smooth*, that of the blanket is *rough*.

*Teacher*—Try the pages of this book. How do they feel?

*Pupil*—Smooth.

*Teacher*—(Putting the bit of plank before the pupils) How does this plank feel?

*Pupil*—Rough.

*Teacher*—Feel the surface of this table.

*Pupil*—It is smooth.

---

## LESSON VII.

*(On things Heavy and Light.)*

**Apparatus:** A ball of clay about 3 inches in diameter, a ball of rags of the same size, a small piece of plank, a piece of jute-stick about 3 feet in length and a bamboo stick of the same size.

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*Teacher*—(Putting the clay ball on the ground) Raise this ball from the ground and hold it over your head.

*Teacher*—(Presenting the ball of rags in the same way) Will you now try *this* ball in the same way? Which could you raise more easily?

*Pupil*—(Shewing the ball of rags) This one.

*Teacher*—The ball of rags is *light*, the other is *heavy*.

*Teacher*—Try to raise the table. Why can't you?

*Pupil*—It is very heavy.

*Teacher*—Try this plank, try this book. Which is the lighter?

*Teacher*—Of the jute-stick and the bamboo stick, tell me which is the heavier. Which is the heavier, the slate or the bamboo stick?

---

## LESSON VIII.

*(On things Brittle and Tough.)*

**Apparatus:** A bamboo stick of the size of a slate pencil, a broken piece of an earthen vessel, a piece of wood and a piece of glass.

*Teacher*—(Shewing the bamboo stick) Do you know what is this?

*Pupil*—A bamboo stick.

*Teacher*—Will you take it and throw it on the table? Do the same with this pencil.

*Pupil*—The pencil is broken!

*Teacher*—The pencil is broken but the bamboo stick is not. A thing that is easily broken is called *brittle*. What is the pencil then?

*Pupil*—It is brittle.

*Teacher*—The thing that is *not* easily broken is called *tough*. What is the bamboc stick then?

*Pupil*—It is tough.



*Teacher*—Very good. Kedar, you told us the other day that your brother's slate fell from his hands and broke at once?

*Kedar*—Yes, Sir.

*Teacher*—What kind of thing is the slate then?

*Kedar*—It is brittle.

*Teacher*—(Showing the broken piece of earthen ware) What is it called, my boy?

*Pupil*—*Khapra*.

*Teacher*—Strike it with this piece of wood, will you?

*Pupil*—The *Khapra* is broken!

*Teacher*—What do you learn from this?

*Pupil*—The *Khapra* is brittle.

*Teacher*—This is a piece of glass. Will you strike it in the same way?

*Pupil*—It is broken!

*Teacher*—What does this show?

*Pupil*—The glass is brittle.

*Teacher*—When you strike a thing that is brittle, what happens?

*Pupil*—It breaks.

*Teacher*—Good. From this time whatever thing you may handle, you must try to find out if it is brittle or tough.

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## LESSON IX.

(*On things Sweet and Sour.*)

**Apparatus:** 3 or 4 earthen tumblers, a *lotah* of good drinking water, a clean piece of rag, some tamarind, and some sugar.

*Teacher*—(Putting the tumblers before the children) My little friends, do you know what are these?

*Pupil*—Earthen tumblers.

*Teacher*—Let me put some water into this tumbler.  
(Taking a little of the tamarind) What is this ?

*Pupil*—Tamarind.

*Teacher*—What am I doing ?

*Pupil*—You are mixing the tamarind with the water in the tumbler.

*Teacher*—(Straining the mixture into another tumbler by means of the rag) Look here, my young chaps, a glass of tamarind mixture for you !

*Teacher*—(Taking the sugar) What is this ?

*Pupil*—Sugar.

*Teacher*—I will do with it just as I did with the tamarind. Done. What then is in this glass, my friends ?

*Pupil*—Sherbet of Sugar.

*Teacher*—Very good. Just take a little of the tamarind mixture on the palm of your right hand, every one of you. How does it taste ?

*Pupil*—Sour.

*Teacher*—Now I will give every one of you a little of the Sherbet. How does this taste ?

*Pupil*—Sweet.

*Teacher*—Good. Henceforth, whatever you may eat or drink at home, you must remember whether it is sweet or sour. You will have to tell me afterwards what things are sweet and what things are sour.

## LESSON X.

(On further knowledge through the sense of taste.)

**Apparatus :** Pepper powder, quinine, salt, a porcelain cup, a *lotah* of good drinking water.

*Teacher*—My young friends, you all remember the treat I gave you yesterday of sherbet and tamarind mixture. I am going to give you quite another kind of treat today.



*Teacher*—(Taking the pepper powder) First of all I would ask you to taste this powder. How does it taste?

*Pupil*—Hot.

*Teacher*—(Taking the quinine) Look here. Do you know the name of this white substance? It is called quinine. What is it called?

*Pupil*—Quinine.

*Teacher*—I will mix it with water in this cup. Will you taste the mixture now?

*Pupil*—Very bitter.

*Teacher*—Quite so. (Taking a little salt) You all know this substance?

*Pupil*—Yes sir; it is salt.

*Teacher*—Let me dissolve it in water in this cup. Will you now taste a little of this mixture? How does it taste?

*Pupil*—Salt.

*Teacher*—Good. Henceforth whatever you eat or drink, you must remember its *taste*.

---

## LESSON XI.

(*On Counting.*)

**Apparatus :** A number of tamarind seeds.

*Teacher*—Good boys, read aloud after my way. One, one and one; two; two and one, three; three and one, four; four and one, five.

*Teacher*—Read again—One, two, three, four, five.

*Teacher*—Put one tamarind seed upon the table; put another. How many have you?

*Pupil*—Two.

*Teacher*—Put another. How many now?

*Pupil*—Three.

*Teacher*—Put another. How many now ?

*Pupil*—Four.

*Teacher*—Put another. How many now ?

*Pupil*—Five.

*Teacher*—How many fingers ?



*Pupil*—Five.

*Teacher*—How many eyes have you ?

How many eyes have two of you ? Ram, will you give me three seeds out of that group ? Kedar, will you give me four ? Gopal, will you give me five ?

---

## LESSON XII.

### *(On Parts of the Human Body.)*

*Teacher*—You all stand up in a row, please. Move to the right. Move to the left. Move again to the right. Move again to the left. Come forward. Move back. Come forward once more. Move back again.

*Teacher*—What things are there on your right, what on the left ?

*Teacher*—Put your right hand on this table. Hold this pen with your left hand. Put forward your right foot. Strike the ground with your left foot.

*Teacher*—Kedar, which hand of yours is this ? Hari, which hand of yours is this ?



*Teacher*—You all put your right hands on this table.  
Put your left hand upon your head, every one of you.

*Teacher*—Show your right eye, left eye, left ear, right ear.

*Teacher*—Hold your left ear with your right hand. Hold your right eye with your left hand. Put your left hand on your right foot. Put your right hand upon your left foot.

*Teacher*—Count the fingers of your right hand. Count those on the left. Count the toes of your right foot. Count those of the left.

*Teacher*—How many noses have you ?

*Pupil*—One.

*Teacher*—Hold the nose with your left hand. How many nostrils have you ?

*Pupil*—Two.

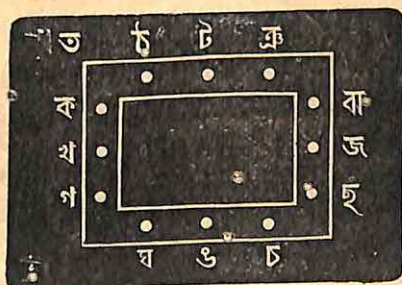
*Teacher*—Show the left nostril with the forefinger of your right hand, and the right nostril with the forefinger of the left.

### LESSON XIII.

(On Drawing.)

**Apparatus**—Flat rules made of bamboo slips.

তথ্যদ্বয় is a slate. Holes are to be made in its wooden frame in the manner indicated below :—



Every child should possess a slate, a slate pencil and a flat rule of the above description.

The children are to be taught how to draw straight lines with the aid of the rule. In drawing a line the rule may be placed in any one of the following positions :—

ক ব, খ জ, গ ছ, ঞ চ, ট ঙ, ঠ দ, ক ঙ, খ ট, etc.

Children will draw straight lines in various positions and show their exercises to the teacher. Their hands and eyes will be gradually trained and afterwards they may dispense with the aid of the rule.

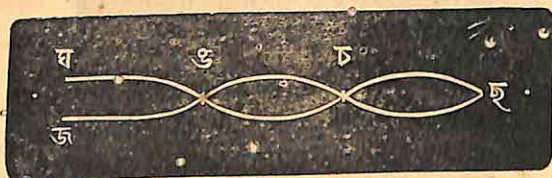
## LESSON XIV.

(On Drawing.)

Small holes are to be made in the slate in the following manner :—



A narrow string may be folded and knotted into a shape of this kind.



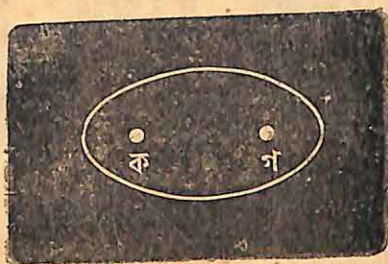
Pass the extremities ঘ and জ through the middle hole and let short sticks be attached to them. The sticks will prevent



the string from coming out when pulled from above. Keep the string tight by a pencil at  $\text{३}$ , the portion  $\text{३ ४ ५}$  of the string being wound on the pencil, and move the pencil all round ; a circle will thus be described. If the pencil be placed at  $\text{४}$  a larger circle will be drawn. If at  $\text{५}$ , the circle will be still larger. This way, as many circles will be successively drawn as there are knots in the string.

If the distance of any knot from  $\text{३}$  be such that a complete circle cannot be described, as much of it as can be drawn will form a curved line.

Pass one end of a string through  $\text{४}$  and attach a stick to it ; pass the other end through  $\text{३}$  and do the same. Now keep the string tight by means of a pencil, and move the pencil all round ; a figure of the following kind will then be described :—



Such a figure is called an *Ellipse*.

## LESSON XV.

(On Counting.)

Teacher—Read aloud after me :—

Five and one, six ; six and one, seven ; seven and one, eight ; eight and one, nine ; nine and one, ten.

One, two, three, four, five, six, seven, eight, nine, ten.

*Teacher*—Look here. How many horses ?



*Pupil*—(Counting the horses by the fore finger) One, two, three ; *three*.

*Teacher*—How many cows ?



*Pupil*—(Counting the cows) One, two, three, four ; *four*.

*Teacher*—How many goats ?



*Pupil*—(Counting the goats) One, two, three, four, five ; *five*.



*Teacher*—How many children ?



*Pupil*—(Counting the children) One, two, three, four, five, six ; *six*.

*Teacher*—How many cats ?



*Pupil*—(Counting the cats) One, two, three, four, five, six, seven ; *seven*.

*Teacher*—How many mice ?



*Pupil*—(Counting the mice) One, two, three, four, five, six, seven, eight ; *eight*.

*Teacher*—How many birds ?



*Pupil*—(Counting the birds) One, two, three, four, five, six, seven, eight, nine ; *nine*.

*Teacher*—How many trees?



*Pupil*—(Counting the trees) One, two, three, four, five, six, seven, eight, nine, ten; *ten*.

## LESSON XIV.

(*On Colour.*)

**Apparatus:** A number of red, yellow, green and blue balls respectively—each made of rags; a piece of red thread; a piece of sulphur.

*Teacher*—Are these balls all of the same colour?

*Pupil*—No Sir.

*Teacher*—Look here. The colour of this ball is *red*. I put before you a group of balls; will you look up the red ones?

*Teacher*—I mix the balls up again. Separate from the group all the balls that have this colour (shewing the yellow colour).

*Teacher*—(After the balls have been separated) The name of this colour is *yellow*. What colour is it?

*Pupil*—Yellow.

[In a similar way the pupils are to be familiarised with green and blue colours.]

*Teacher*—(Looking at the clear sky) Let me have a ball whose colour is like that of the sky.

*Teacher*—Look at the *Bel* tree. What colour are its leaves?

*Pupil*—Green.



*Teacher*—(Holding the piece of thread before the pupils)  
What is its colour ?

*Pupil*—Red.

*Teacher*—(Shewing the piece of sulphur) What colour is it ?

*Pupil*—Yellow.

*Teacher*—You have now been familiar with certain colours.  
What are they ?

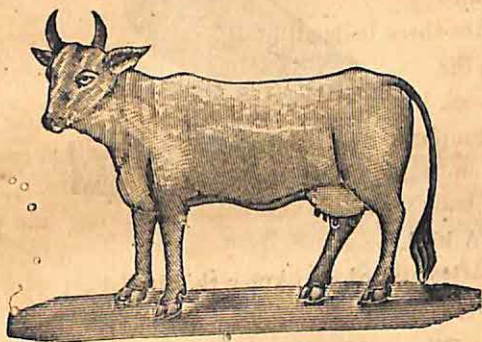
*Pupil*—White, black, red, yellow, green and blue.

*Teacher*—Very good. Henceforth, whenever you happen to see a thing whose colour is like one or other of the above, you must remember it.

## LESSON XVII.

(On Different kinds of Animals.)

*Teacher*—What is this the picture of ?



*Pupil*—A cow.

*Teacher*—Where are the hands of the cow ?

*Pupil*—The cow has no hands.

*Teacher*—How many legs has the cow ?

*Pupil*—Four.

*Teacher*—(Pointing at the tail) What is this

*Pupil*—The tail.

*Teacher*—Have you a tail ?

*Pupil*—No Sir.

*Teacher*—What is that which you have, but the cow has not ?

*Pupil*—The hands.

*Teacher*—What is that which the cow has, but you have not ?

*Pupil*—The tail.

*Teacher*—Look at the picture and tell me what else the cow has, but you have not.

*Pupil*—The horns.

*Teacher*—Name some animals that have four legs and a tail like the cow.

*Pupil*—The cat, the dog, the goat, the horse, the buffalo.

*Teacher*—What is this the picture of ?



*Pupil*—A bird.

*Teacher*—Do any of you know this bird ?

*Kedar*—It is a crow.

*Teacher*—What other birds have you seen ?

*Pupil*—The sparrow, the pigeon, the dove, the hawk, the crane, the adjutant.

*Teacher*—How many legs has a bird ?

*Pupil*—Two.

*Teacher*—How does a bird go from one place to another ?

*Pupil*—By flying.



*Teacher*—Men, cows, horses, goats, cats and dogs cannot, but a bird can. What ?

*Pupil*—To fly.

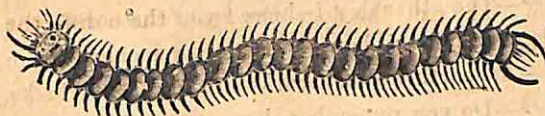
*Teacher*—How do men, cows, horses, goats, cats and dogs go from one place to another ?

*Pupil*—By walking.

*Teacher*—Do you know what is the word for walking very fast ?

*Pupil*—Running.

*Teacher*—Who can say what is in this picture ?



*Pupil*—A centipede.

*Teacher*—How many legs has it ?

*Pupil*—Many legs.

*Teacher*—Very well, what other animal have you seen that have many legs.

*Pupil*—The Iulus.

*Teacher*—Good, you see then that some animals have two legs, some have four, and some have more than four. Henceforth whatever animal you may see, you must find out if it has legs, and if so how many.

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## LESSON XVIII.

(On different Kinds of Animals.)

*Apparatus*—A vessel of water with some small live fishes in it.

*Teacher*—(Pointing at the fishes) What are these my boy ?

*Pupil*—Fish.

*Teacher*—Where do the fishes live ?

*Pupil*—They live in water.

*Teacher*—How do the fish go from one place to another ?

*Pupil*—By swimming.

*Teacher*—(Taking out a fish from the water) I take this fish out of water and put it on the ground. Observe its condition. How it moved in water ? What is it doing now ?

*Pupil*—It does not appear to move well now.

*Teacher*—(A little while after) Will you touch the fish ? What do you find ?

*Pupil*—It is dead !

*Teacher*—The other day I shewed you three different kinds of animals near Kedar's house. Do you remember them ?

*Pupil*—An earth-worm, a cockroach and some ducks.

*Teacher*—Do you remember how many legs has each of these animals ?

*Pupil*—The earth-worm has no legs, the cockroach has six legs, and the duck has two legs only.

*Teacher*—How does the earth-worm move then ?

*Pupil*—It crawls.

*Teacher*—How does the cockroach go from one place to another ?

*Pupil*—It can fly as well as walk.

*Teacher*—What were the ducks doing ?

*Pupil*—They were swimming in the tank.

*Teacher*—What did they do when they were driven out of the water ?

*Pupil*—They began to walk on the ground.

*Teacher*—Good. Henceforth you must carefully observe how each animal moves.

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## LESSON XIX.

*(On Stick laying.)*

**Apparatus:** A number of narrow bamboo sticks each about 3 or 4 inches in length.

*Teacher*—Look here my boys. I form a corner with two sticks.



Which way does it open ?

*Pupil*—It opens downwards.

*Teacher*—Will you form a corner of this kind ? Form a corner which opens upwards. Form another which opens towards the left, and another opening towards the right.

*Teacher*—How many sticks are required to form this room ?



*Pupil*—Three sticks.

*Teacher*—How many corners has it ?

*Pupil*—Three corners.

*Teacher*—How many sticks then are required to form a three-cornered room ?

*Pupil*—Three sticks.

*Teacher*—How many corners has this room ?

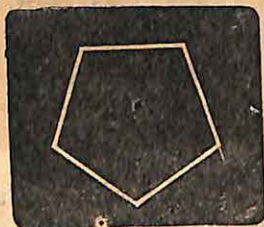


*Pupil*—Four corners.

*Teacher*—How many sticks are required to form it ?

*Pupil*—Four sticks.

*Teacher*—How many corners has this room ?



*Pupil*—Five corners.

*Teacher*—How many sticks are required to form it ?

*Pupil*—Five sticks.

*Teacher*—I will give three sticks to every one of you. Will you each form a three-cornered room ?

*Teacher*—(Giving one more stick to each) How many sticks have you got this time ?

*Pupil*—Four sticks.

*Teacher*—Will each of you now form a four-cornered room ?

*Teacher*—(Giving one more stick to each) How many sticks have you got now ?

*Pupil*—Five sticks.

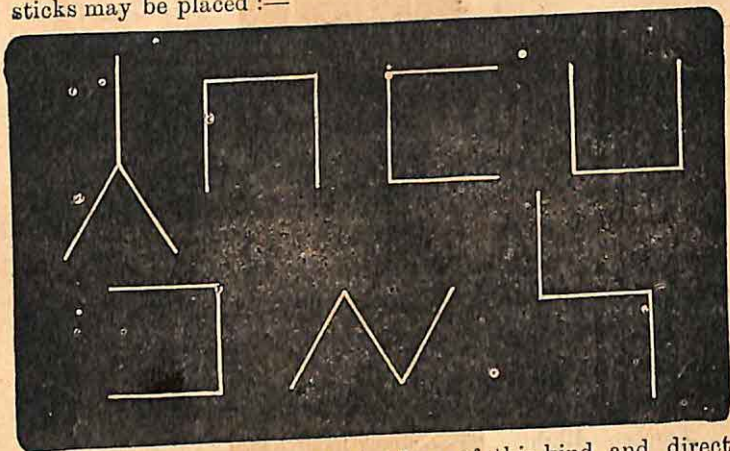
*Teacher*—Each of you must form a five-cornered room this time.



## LESSON XX.

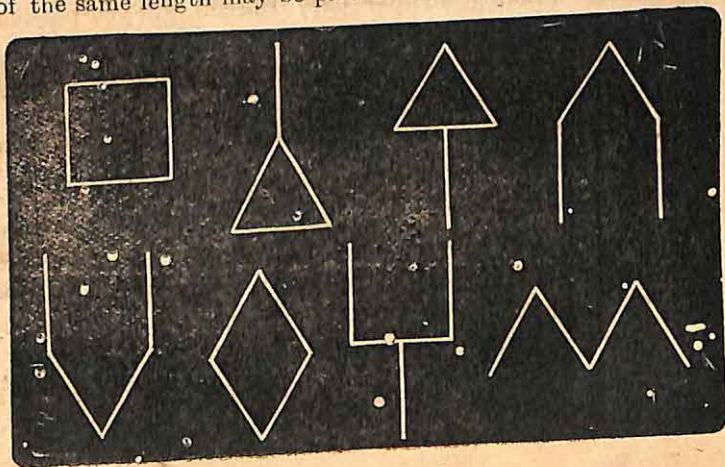
*(On Stick laying.)*

The following are some of the forms in which three equal sticks may be placed :—



The teacher is to construct a form of this kind and direct the pupils to copy it. After they have successfully copied one, the next should be presented to them, and so on.

The following are some of the forms in which four sticks of the same length may be placed :—



The teacher is to construct the first of these forms and direct the pupils to copy it. After they have successfully copied it, the next is to be presented to them, and so on.

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## LESSON XXI.

(*On Counting.*)

**Apparatus:** Some cups made of cocoa-nut shell and a number of tamarind seeds.

*Teacher*—Kedar, will you put ten of the seeds in this cup? Gopal, will you put ten more in that?

*Teacher*—(Putting these two cups before the pupils) How many *tens* are there in these two cups?

*Pupil*—Two tens.

*Teacher*—Right. "Two tens" has got a small name. It is *twenty*. To say "twenty" is the same as to say "two tens." Tell me then how many seeds these two cups contain.

*Pupil*—Twenty seeds.

*Teacher*—(Taking another cup) Harish, will you put ten more seeds in this cup?

*Teacher*—(Placing this cup in a row with the other two) How many *tens* of seeds are there in these *three* cups now?

*Pupil*—Three tens.

*Teacher*—"Three tens" has got a small name. It is *thirty*. To say "thirty" is the same as to say "three tens." How many seeds are there in these three cups then?

*Pupil*—Thirty seeds.

[ In a similar way the children should be made to understand clearly the meaning of each of the terms *forty, fifty, sixty, seventy, eighty, ninety* and *one hundred*. ]

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## LESSON XXII.

(On Counting.)

**Apparatus :** A number of tamarind seeds.

**Teacher**—Gopal, will you put a group of ten seeds before me ? I will put another seed near the group. How many have we now ?

**Pupil**—Ten and one.

**Teacher**—Right. There is a little name for “ten and one.” It is *eleven*. To say “eleven” is the same as to say “ten and one”. How many seeds then are before me now ?

**Pupil**—Eleven seeds.

[In a similar way the meaning of each of the terms *eleven*, *twelve*, *thirteen*, etc. up to *nineteen*, should be clearly explained to the pupils.

On a second day, the terms from *twenty one* to *twenty nine* should be explained ; on a third day, from *thirty one* to *thirty nine* ; and so on, up to *ninety nine*.]

**Note.** The children should stand up in a row and the teacher should make them read aloud the following :—

Ten and one, *eleven*. Ten and two, *twelve*. Ten and three, *thirteen*, etc. Two tens, *twenty*. Two tens and one, *twenty one*, etc. Three tens, *thirty*, etc. etc. Nine tens and nine, *ninety nine*. Ten tens, *one hundred*. The children should be made to go through this exercise almost every day until they have become thoroughly familiar with the terms and their meanings.

## LESSON XXIII.

(On the Writing of Numerals.)

**Apparatus :** A number of tamarind seeds, and a few pieces of string each about one cubit long.

The teacher is to write with a piece of chalk the first numeral "1" on the table of each child, and direct him to arrange tamarind seeds along it. After the seeds are arranged the figure will assume the following form :—



The same process is to be repeated successively with the numerals 2, 3, 4, 5, 6, 7 and 8.

After the children have become thoroughly accustomed to the work of arranging seeds upon chalk marks, they should each be provided with a string about a cubit long, and taught to place it on the table successively in the form of the above numerals.

After the children have had sufficient training in seed placing and string laying in the manner above indicated, the teacher is to write the numerals on the board, one at a time, and direct them to copy it on their slates.

## LESSON XXIV.

(On a child's Table.)

*Teacher*—(Laying his hand on the table) What is this called?

*Pupil*—A table.

*Teacher*—What is it for?

*Pupil*—It is to place seeds on, to place our slates on.

*Teacher*—Of what is it made?

*Pupil*—It is made of wood.



*Teacher*—What other things of wood are there in this room?

*Pupil*—The boards, the posts of the house, the door, the door-frame, the window shutters.

*Teacher*—How many legs has the table?

*Pupil*—Four legs.

*Teacher*—What is the form of the surface of the table?

*Pupil*—Four-cornered.

*Teacher*—What other four-cornered things are there in this room?

*Pupil*—The floor of this house, the boards, the door, the window-shutters, the door-frame and the window-frames.

*Teacher*—Will you lightly pass your fingers over the table? How does it feel?

*Pupil*—Smooth.

*Teacher*—Will you similarly feel the under surface?

*Pupil*—Rough.

*Teacher*—Will you try to raise the table? Is it light or heavy?

*Pupil*—Heavy.

*Teacher*—Can the table move from one place to another just as you do?

*Pupil*—No.

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## LESSON XXV.

(On a piece of Jute Stick.)

**Apparatus:** Same pieces of Jute stick, and a *Mulsha* full of water.

*Teacher*—What is this, my young friends?

*Pupil*—A jute stick.

*Teacher*—Yes. It is the wood of the jute plant. What is it used for?

*Pupil*—For kindling a fire.

*Teacher*—Of what colour is it?

*Pupil*—White.

*Teacher*—What other things of this colour have you seen?

*Pupil*—Milk, salt, cloth, lime, paper.

*Teacher*—Just see if the stick is hollow within.

*Pupil*—Yes, Sir.

*Teacher*—(Putting the *Malsha* of water before the children and giving each a piece of Jute stick about one cubit long) Dip one end of the stick into the water and blow through the other. What happens?

*Pupil*—The water bubbles!

*Teacher*—So it does! Very well, do the opposite now. Instead of blowing through this end suck through it.

*Pupil*—(Throwing water out of the mouth) Water entered into the mouth!

---

## LESSON XXVI.

### (On Water.)

**Apparatus:** A *malsha* or *handi* full of water, a lump of dry clay, a brass glass, a pice and a small earthen cup containing embers.

*Teacher*—My little friends, what do you find in this *Malsha*?

*Pupil*—Water.

*Teacher*—What do you do, when you are thirsty?

*Pupil*—We drink water.

*Teacher*—Sashi, how else is water used?

*Sashi*—We bathe in water.



*Teacher*—What else is it used for, Harish?

*Harish*—We wash our faces and hands with water.

*Teacher*—Kedar, will you tell me some other use of water?

*Kedar*—Our clothes and utensils are cleaned with water.

*Teacher*—We all drink water when we are thirsty. What other animals do the same?

*Pupil*—Cows, goats, horses, cats, dogs, birds.

*Teacher*—How do you feel if you don't get water when you are thirsty?

*Pupil*—It pains us very much.

*Teacher*—In what places on the surface of the earth do you find water?

*Pupil*—In rivers, tanks and wells.

*Teacher*—(Pointing to the sky) Have you ever seen water falling from above?

*Pupil*—Yes Sir, when it rains.

*Teacher*—(Taking the lump of clay) Will you feel this lump? Is it hard or soft?

*Pupil*—Hard.

*Teacher*—(Soaking the lump in water) See how it feels now?

*Pupil*—Soft.

*Teacher*—What do you learn from this?

*Pupil*—Hard clay when soaked in water becomes soft.

*Teacher*—Very good. (The children are now to be seated in a ring and the brass glass with the pice in its bottom is to be placed upon a table in the middle; the children and the glass being so placed that none of them can see the pice on the bottom of the glass) Do any of you see the pice?

*Pupil*—No Sir.

*Teacher*—Take care not to move. (Filling the glass with water) Do you see it now?

*Pupil*—Yes Sir.

*Teacher*—(Holding a slate in a slanting position and putting a drop of water on the upper part of it) Look at the drop. What is it doing?

*Pupil*—It is going down.

*Teacher*—Water always goes *down* whenever it finds a way to do so.

*Teacher*—(Putting the cup of embers before the children) What do you find in this cup?

*Pupil*—Fire.

*Teacher*—I will pour water on the fire. What happens?

*Pupil*—The fire is put out.

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## LESSON XXVII.

(*On Milk.*)

**Apparatus:** A cup of milk, a cup of water, and two marbles.

*Teacher*—(Putting the cup of milk before the children) Here is a thing, my boys, which you all like most. What do you call it?

*Pupil*—Milk.

*Teacher*—Thrust your fore finger into the milk and move it to and fro. Do you find it difficult to move the finger?

*Pupil*—Not at all.

*Teacher*—Name two other things which you can similarly handle without any difficulty.

*Pupil*—Water and oil.

*Teacher*—Of what colour is the milk?

*Pupil*—White.

*Teacher*—Of what color is the water?

*Pupil*—It is neither white nor black.



*Teacher*—Yes. Water may be said to have no colour. Now tell me, my boys, what is the difference between milk and water.

*Pupil*—The milk is white, the water has no colour.

*Teacher*—I will throw this marble into the milk. Do you see the marble now ?

*Pupil*—No Sir.

*Teacher*—I will throw this one into the water. Do you see it ?

*Pupil*—Yes.

*Teacher*—You see then there is another difference between milk and water. If you throw a marble into water it is seen but if you throw it into milk it is not seen.

*Teacher*—When milk is allowed to stand in a vessel in which it has been boiled what forms on its surface ?

*Pupil*—Cream.

*Teacher*—How do you like cream ?

*Pupil*—We like it very much.

*Teacher*—Name some of the things that we get from milk.

*Pupil*—Cream, thickened milk, curd, butter and *ghee*.

*Teacher*—Very good, you are very fond of *Sandesh* and *Rashagolla*, aren't you ?

*Teacher*—These things cannot be prepared without milk. Which animal gives you milk ?

*Pupil*—The cow.

*Teacher*—What great good does the cow do to us then ? If there were no cow where would you get *Sandesh* and *Rashagolla* ? It is our duty therefore to take care of the cow and feed her well.

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## LESSON XXVIII.

(On a *Handi*.)

**Apparatus :** Two *handis*, one sound and the other having a crack.

*Teacher*—What is this, my boy ?

*Pupil*—It is a *handi*.

*Teacher*—What is it used for ?

*Pupil*—It is used for cooking rice.

*Teacher*—What else is it used for ?

*Pupil*—It is also used for putting things in.

*Teacher*—Do you know what things are put into a *handi* ?

*Pupil*—Rice, pulses, salt, sugar.

*Teacher*—What is its colour ?

*Pupil*—Red.

*Teacher*—What is it made of ?

*Pupil*—It is made of clay.

*Teacher*—Some day I will take you to a potters' house and show how *handis* are made. Do you know what happens if I throw this *handi* on the floor ?

*Pupil*—It will break.

*Teacher*—How Does the edge of the *handi* look ?

*Pupil*—It looks like a ring.

*Teacher*—(Striking on the *handi* with the fore finger) Listen, how it sounds. Will you also sound it in this manner ?

*Teacher*—(Taking a *handi* with a crack in it) Will you sound this one now ? Do the two *handis* sound alike ?

*Pupil*—No Sir.

*Teacher*—Very good. Mark these two sounds. Henceforth you will be able to find out if a *handi* is good or bad simply by observing its sound.

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## LESSON XXIX.

(On a young Mango Plant.)

**Apparatus :** An earthen tub filled with moist clay, a young mango plant and a mango stone.

*Teacher*—My little chaps, you are fond of mangoes, are n't you ? Do you know what is this ?

*Pupil*—It is a young mango plant.

*Teacher*—Do any of you know how it grew ? (Shewing the stone) This is a familiar thing, is n't it ? What is it called ?

*Pupil*—A mango stone.

*Teacher*—The young plant that you see before you grew out of a stone like this ! If a stone like this be put into the ground a plant will gradually grow out of it. Let us put this stone into the clay in the tub and watch it day by day.

*Teacher*—(Shewing the roots of the plant) Do you know where this part of the plant lies ?

*Pupil*—It lies within the ground.

*Teacher*—Quite so. This part is called the *root* of the plant.

*Teacher*—(Shewing the stem) Where does this part lie ?

*Pupil*—It lies above the ground.

*Teacher*—This part is called the *stem*. (Handling the leaves) What are these ?

*Pupil*—The leaves.

*Teacher*—Can plants move from one place to another just as we do ?

*Pupil*—No Sir.

*Teacher*—Plants live, grow and die just as animals do. Do you know what the plants feed on ? Their food is watery, which they suck in from the ground through the roots. The roots are therefore the mouths of plants.

*Teacher*—There is no water in a dry soil. So a plant can not grow on a dry soil. We shall therefore have to moisten the earth in the tub with water every day.

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### LESSON XXX.

*(On a Branch of a Plant with Buds and Flowers.)*

*Teacher*—What are the different parts of a plant that you learnt the other day?

*Pupil*—The root, the stem, the leaves.

*Teacher*—Very good. I will show you another part of the plant today. (Holding the branch by the left hand whilst shewing a flower by the right) Certainly you all know what *this* is called.

*Pupil*—It is a flower.

*Teacher*—(Touching a bud) Do you know this? It is a bud. What is the difference between a bud and a flower?

*Pupil*—The flower is larger than the bud.

*Teacher*—Yes, it is the bud that gradually opens out into a flower.

*Teacher*—Will you now repeat, my good boy, the names of the four parts of a plant that you have learnt?

*Pupil*—The root, the stem, the leaves and the flower.

*Teacher*—Very good.

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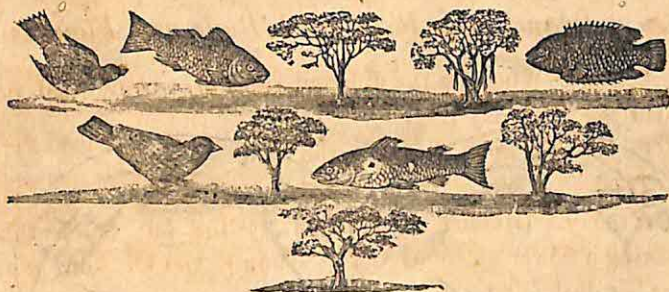
## LESSON XXXI.

(On Counting.)

1. Look at this picture. How many dogs are there ?  
How many cats ? How many beasts ?

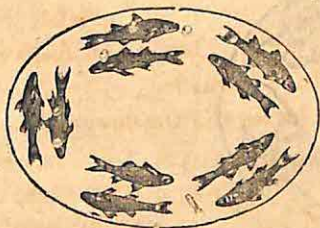


2. How many birds in this picture ? How many fishes ?  
How many trees ? How many objects ?

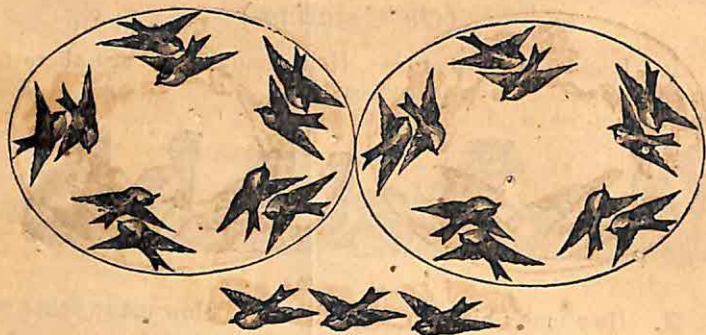


3. What does *eleven* mean ? What does *seventeen* mean ;  
What does *twenty-three* mean ? What does *thirty-two*  
mean ? etc.

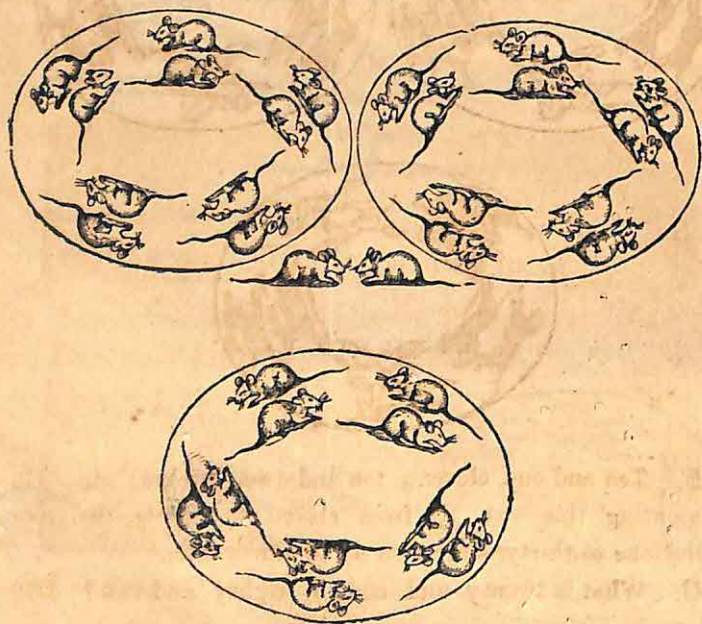
4. How many fishes have we here ?



How many birds?



How many mice?





How many animals ?



5. Ten and one, eleven ; ten and two, twelve ; etc. Go on counting this way (i) from eleven to twenty, (ii) from twenty-one to thirty, and so on up to ninety-nine.

6. What is twenty and eight ? eighty and two ? fifty and six ?

7. Two tens, twenty ; three tens, thirty ; etc. ; go on counting this way from twenty to one hundred.

8. If there be ten canary-birds in a cage how many will there be in eight cages ?

9. A gardener plants a number of shrubs in nine rows. If there be ten in each row, how many shrubs are planted in all ?

10. If I put ten mangoes in a *handi*, how many will there be in ten *handis* ?

## CHAPTER VI.

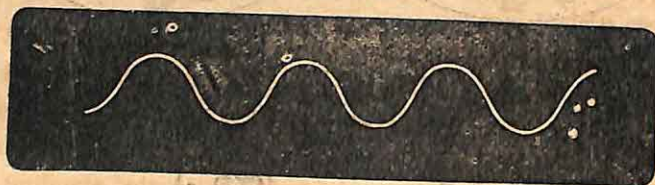
*The training of Infants—Stage II.*

### LESSON I.

(*On Form.*)

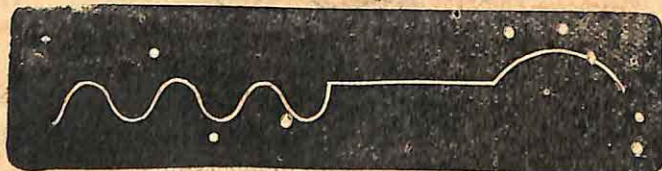
**Apparatus :** A number of bamboo sticks.

*Teacher*—What kind of line is this ?



*Pupil*—It is a crooked line.

*Teacher*—What have you to say about this ?



*Pupil*—(Shewing by the fore finger) This part is a crooked line, this part is a straight line, this part is a curved line.



*Teacher*—How does this look ?



*Pupil*—Three curved lines side by side.

*Teacher*—Very good. (Drawing three angles on the child's table in the following manner.)



Three angles for you ? Will you try to imitate them with these sticks ?

*Teacher*—(After the imitations have been made) Well done, my boy. Mark the positions of the two sticks in each of these angles. In the first, one stick is lying down and the other is standing up by its side. In the second, the standing up stick is inclined to the left. In the third, the standing up line is inclined to the right.

*Teacher*—The first of these angles is called a *right angle* ; the second, an *obtuse angle* ; and the third, an *acute angle*. What are they respectively called ?

*Pupil*—A right angle, an obtuse angle, an acute angle.

*Teacher*—Very good.

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## LESSON II.

(On Form.)

**Apparatus:** A number of midribs of cocoa-nut leaflets.

*Teacher*—(Drawing a triangle on the board) What have I drawn on the board?

*Pupil*—A three cornered room.

*Teacher*—How many sides has it?

*Pupil*—It has three sides.

*Teacher*—Yes. Henceforth you must call a room of this kind a *triangle*.

*Teacher*—(Drawing an equilateral triangle on the board) Here is a triangle. Let us measure its sides. Do you know where these sticks come from?

*Pupil*—They come from the leaves of a cocoa-nut tree.

*Teacher*—Right. Now look, see how such a stick will help us in measuring the sides of the triangle on the board.

*Teacher*—(Breaking off portions equal in length to the sides of the triangle) Will you put these little sticks together and compare them?

*Pupil*—They are all equal.

*Teacher*—What does this shew?

*Pupil*—The sides of the triangle are equal.

*Teacher*—A triangle whose three sides are equal is called an *equilateral* triangle.

*Teacher*—(Drawing an isosceles triangle on the table of each child) Take a stick, every one of you, and measure the sides of this triangle in the manner I have shewn.

*Pupil*—Two of these bits are equal, the other is a smaller (or larger) one.

*Teacher*—Quite so. A triangle, two of whose sides are equal, is called an *isosceles* triangle.



*Teacher*—(Now drawing a scalene triangle on each pupil's table) Will you similarly measure the sides of this triangle?

*Pupil*—No two of these bits are equal.

*Teacher*—Quite so. A triangle which has three unequal sides is called a *scalene* triangle.

*Teacher*—What are the three kinds of triangles that you have learnt to-day?

*Pupil*—An equilateral triangle, an isosceles triangle and a scalene triangle.

*Teacher*—Very good. Don't forget them.

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### LESSON III.

(*On Form.*)

**Apparatus:** A number of midribs of cocoa-nut leaflets.

*Teacher*—(Drawing a quadrilateral on the board) What have I drawn on the board, my boys?

*Pupil*—A four cornered room.

*Teacher*—How many sides has it?

*Pupil*—It has four sides.

*Teacher*—Yes. Henceforth you must call a room of this kind a *quadrilateral*.

*Teacher*—(Drawing a square on each pupil's table) Mark the angles of this quadrilateral.

*Pupil*—They are all right angles.

*Teacher*—Yes. Now take a stick, every one of you, and measure the sides of the quadrilateral.

*Pupil*—The four bits are all of the same length.

*Teacher*—You see then that the sides of this quadrilateral are equal and its angles are all right angles?

*Pupil*—Yes Sir.

*Teacher*—A quadrilateral of this kind is called a *square*.

*Teacher*—(Drawing an oblong on each pupil's table) Will you mark the angles of *this* quadrilateral ?

*Pupil*—All the four angles are right angles.

*Teacher*—Right. Look at the sides.

*Pupil*—Two sides are long and two are short.

*Teacher*—Measure the long sides first.

*Pupil*—(After breaking off bits from the stick) They are equal.

*Teacher*—Measure the short sides now.

*Pupil*—(After doing the same) They are equal too.

*Teacher*—Quite right. You see then that two equal long sticks and two equal short sticks are necessary to form a quadrilateral of this kind.

*Pupils*—Yes Sir.

*Teacher*—Such a quadrilateral is called an *oblong*.

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## LESSON IV.

(*On Form.*)

**Apparatus :** A quantity of clay for forming bricks.

*Teacher*—(Forming a brick) Look here, what a beautiful thing I have made. It is like a brick ? Count the number of its faces, will you ?

*Pupil*—It has six faces.

*Teacher*—Very right. (Shewing the vertical faces) These four faces are standing up straight ; the upper and lower faces are lying down. Is n't it ?

*Pupil*—Yes Sir.

*Teacher*—How many faces standing up and how many lying down ?

*Pupil*—Four faces standing up and two lying down.



*Teacher*—(Shewing the edges) These are the *edges* of the brick. Will you count their number ?

*Pupil*—The brick has twelve edges.

*Teacher*—How many of them are standing up and how many lying down ?

*Pupil*—Four of the edges are standing up and eight lying down.

*Teacher*—Good. Now mark the forms of the faces.

*Pupil*—The faces are all oblong.

*Teacher*—Very good, my boys. (Forming a cube) Here is another thing of that kind for you. How are *its* faces ?

*Pupil*—Its faces are all square.

*Teacher*—How many faces has it and how many edges ?

*Pupil*—It has six faces and twelve edges.

*Teacher*—What is the difference between the two things that you see before you ?

*Pupil*—The faces of the first are all oblong, those of the second are all square.

*Teacher*—The second thing is called a *cube*.

## LESSON V.

(On Colour.)

*Teacher*—Last year you learnt some colours, my little chaps. What are they ?

*Pupil*—White, black, red, yellow, green and blue.

*Teacher*—Yes. I asked you also to mark and remember such things as had those colours. Let me see what you have done. What animals of white colour have you seen ?

*Pupil*—Cows, goats, cats, horses, pigeons and ducks.

*Teacher*—What animals of black colour ?

*Pupil*—Cows, goats, cats, dogs, crows, black-birds, ants, and beetles.

*Teacher*—What other black things have you seen ?

*Pupil*—Umbrellas, *Hookahs*, ink, coats, tar, tape, sticks, iron, coal.

*Teacher*—What things of red colour have you seen ?

*Pupil*—Flowers, cloths, tape, paper, lac, thread, vermilion.

*Teacher*—What things of yellow colour ?

*Pupil*—Flowers, flowers of the mustard plant, turmeric, the pulp of a ripe jack, jack-wood planks.

*Teacher*—What things of green colour ?

*Pupil*—Leaves of trees, grass, paper, wool, tape, satin.

*Teacher*—What things of blue colour ?

*Pupil*—Thread, paper, flowers.

*Teacher*—Very good.

## LESSON VI.

### (On Colour.)

**Apparatus :** Gray paper, an orange, a brinjal, a little of magenta, a piece of clean rag, a rose, a porcelain cup, and some water.

*Teacher*—Look at that cloud in the sky. Of what colour is it ?

*Pupil*—The colour seems to be white and also black.

*Teacher*—Yes. Black and white mixed. Such a colour is called *gray*.

*Teacher*—What colour is this paper ?

*Pupil*—Gray.

*Teacher*—(Shewing the orange) You know this ?

*Pupil*—It is an orange.

*Teacher*—What colour is it ?

*Pupil*—It seems to be red and also yellow.

*Teacher*—Yes. Red and yellow mixed. This colour is called *Orange colour*.



*Teacher*—(Shewing the brinjal) What is this?

*Pupil*—A brinjal.

*Teacher*—What is its colour?

*Pupil*—Blue and red mixed.

*Teacher*—Very good. This is the *indigo* colour. Have any of you seen a cloth of this colour?

*Pupil*—My mother has got a Bombay *Saree*, she told me one day that it was of the indigo colour.

*Teacher*—Did she? Very good. (Shewing the magenta) This is a thing not known to any of you I suppose. It is called magenta. On mixing this with water a beautiful colour will be produced.

*Teacher*—(On dissolving the magenta in water and soaking the rag in it) Will you put this rag in the sunshine to dry?

*Teacher*—(After the rag has become dry) What colour is the rag now?

*Pupil*—It is like red, but not quite red.

*Teacher*—White mixed with red, isn't it?

*Pupil*—Yes Sir.

*Teacher*—This is the *pink* colour. (Shewing the rose) Do you know this?

*Pupil*—It is a rose.

*Teacher*—What difference is there between the colour of this flower and the colour of that rag?

*Pupil*—No difference.

*Teacher*—Quite so. What colours have you learnt to-day?

*Pupil*—Gray, orange, indigo and pink.

*Teacher*—Good. Henceforth you must try to find out if any of the things you see around you have any of these four colours.

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## LESSON VII.

*(Training through the Hand.)*

**Apparatus:** A green and a ripe fruit of any kind, a ball of soft clay, a bit of wood, a bit of glass, papers of various degrees of smoothness, a bit of blanket, a small piece of rag, and a knife.

*Teacher*—Shut up your eyes. Keep them shut and tell me the form of this piece of paper.

*Pupil*—I cannot say, as I do not see the paper.

*Teacher*—Keep your eyes shut and tell me the colour of the thing I have in my hand.

*Pupil*—I cannot say, as I do not see the thing.

*Teacher*—All right. Open your eyes now. What do you know through your eyes then?

*Pupil*—Forms and colours of things.

*Teacher*—Yes. What do you know through your hands?

*Pupil*—Whether a thing is hard or soft, whether it is rough or smooth, whether it is light or heavy. These we know through our hands.

*Teacher*—Very good. (Putting the green and the ripe fruit, the ball of clay, the bit of wood, and a knife before the class) Try these things and arrange them one after another in a line in the order of their hardness.

*Teacher*—(Putting the various kinds of papers, the bit of blanket, and the piece of rag before the class) Will you now try these things and arrange them one after another in a line in the order of their smoothness?

*Teacher*—(Putting a number of light and heavy things before the class) Will you now try these things and arrange them one after another in a line in the order of their lightness.

*Teacher*—(Putting the bit of glass and the knife before the pupils) Will you just try to scratch the glass with this knife?



*Pupil*—No scratch is made !

*Teacher*—Try then to scratch the knife with the glass.

*Pupil*—A scratch is made now.

*Teacher*—What does this shew ?

*Pupil*—The bit of glass is harder than the knife.

*Teacher*—Very good.

## LESSON VIII.

(*Training through the sense of Taste.*)

**Apparatus:** Some oranges, a ripe plantain, a little sugar, some tamarind, some porcelain cups, a *lotah* of good drinking water, green plums, ripe plums, a little salt, extract of some dried leaves of the jute plant, extract of Gentian (*chirata*) and pepper powder.

*Teacher*—What things are sweet, my boys ?

*Pupil*—Treacle, sugar, sugar-candy, *Sandesh*, *Rashagolla*, rice-pudding.

*Teacher*—What things are sour ?

*Pupil*—Green mangoes, tamarind, lemons, green plums, *amlakis*.

*Teacher*—(Taking an orange) Will you try and tell me how the orange tastes ?

*Pupil*—If seemes to be sweet and also sour.

*Teacher*—Quite right. The juice of an orange is like a mixture of two different juices, one sweet and the other sour.

*Teacher*—(Shewing the ripe plantain) What is this and what do you know of its taste, my boy ?

*Pupil*—It is a ripe plantain, its taste is sweet.

*Teacher*—Here is some sugar and here is a little tamarind. Now I will mix together the pulp of this plantain, the sugar and the tamarind. Take a little of this, every one of you. How do you like it ?

*Pupil*—We like it very well.

*Teacher*—Is it sour or sweet ?

*Pupil*—It is both.

*Teacher*—Take this green plum and also a little tamarind. Taste them and tell me which is the more sour of the two.

*Teacher*—Take this ripe plum and a portion of this orange. Which is the more sweet ?

*Teacher*—Taste this green plum, will you ?

*Pupil*—It is sour.

*Teacher*—Take it with a little salt. How does it taste now ?

*Pupil*—Its taste is not so sour now as before.

*Teacher*—Will every one of you now sip a little of each of these two extracts ? Which is the more bitter ?

[The teacher himself should do the same to test the correctness of the answer.]

*Teacher*—(Mixing pepper powder with sugar) Will you taste this mixture ?

*Pupil*—It is both hot and sweet.

*Teacher*—Very good.

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## LESSON IX.

### (Training through the Ear.)

*Teacher*—Shut up your eyes, my young lads. (Striking a book or any other thing with the hand) What have you heard ?

*Pupil*—A sound.

*Teacher*—Shut up your eyes once more. (Closing the lips and making a sound like the groaning of a tiger) What have you heard this time ?

*Pupil*—Another sound.



*Teacher*—Open your eyes but shut up your ears by thrusting the forefingers of your hands into the ear-holes.

(Striking a book before the pupil's eyes) What do you hear ?

*Pupil*—Nothing.

*Teacher*—You all saw me striking the book with the forefinger of my right hand. Why did n't you hear the sound then ?

*Pupil*—Our ears were closed.

*Teacher*—What then if you had no ears ?

*Pupil*—We could not hear any sound.

*Teacher*—Do you know what we call them who cannot hear ?

*Pupil*—Deaf.

*Teacher*—Very good. (Giving a light stroke on the table and immediately afterwards a big one) How many sounds have you heard ?

*Pupil*—Two sounds.

*Teacher*—What is the difference between the two ?

*Pupil*—The first is small, the second is big.

*Teacher*—Quite so. A small sound is called a *soft* sound, and a big sound is called a *loud* sound.

*Teacher*—Kedar, will you come to me ? I will tell you something in whispers. "Go behind this house and make a sound like 'coo' ; then go to that spot (pointing to a definite place) and do the same, will you ?"

*Teacher*—(After the coos are heard) How many coos have you heard ?

*Pupil*—Two.

*Teacher*—What is the difference between the two ?

*Pupil*—The first one seemed to come from behind this house, and the other from some distance.

*Teacher*—Right. Henceforth whenever you hear a sound you must try to find out the direction and the distance of the place from which it comes.

*Teacher*—(In a very soft and pleasant voice) “Gopal, my darling, will you come to me?” (Immediately afterwards, in a rough and disagreeable voice) “Will you come to me, Gopal?” What is the difference between these two ways of speaking, my little friends?

*Pupil*—Gopal would like to be spoken to in the first way but not in the second.

*Teacher*—Quite right. A sound is called *pleasant* when you like to hear it, and *unpleasant* when you don't. You must therefore all learn to speak in a pleasant manner.

*Teacher*—You know very well what crying means. At times you cry and at times you laugh. You see also others doing the same. Can you tell me then what is the difference between a cry and a laugh?

*Pupil*—A cry is caused by pain, a laugh is caused by pleasure.

*Teacher*—Quite right. There are other sounds also which give similar indications. Here is an instance:—(Groaning like a man suffering from fever) “ॐ, ॐ, ॐ” (Then mimicking a singing tone) “ॐ ॐ ॐ—ॐ—ॐ—ॐ”. What is the difference between these two kinds of sounds, my little cnaps?

*Pupil*—The first seems to be caused by pain, the second by pleasure.

*Teacher*—Very good. You must have also heard different animals making different sounds. You must henceforth try to know the animals by their sounds, as also to find out the cause of any particular sound.

*Teacher*—To speak is but to make a number of sounds through the mouth. If we had not the power to make such sounds, what then?



*Pupil*—We could not speak.

*Teacher*—Quite right. Do you know what we call them who cannot speak?

*Pupil*—Dumb.

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## LESSON X.

*(Training through the Sense of Smell.)*

**Apparatus:** A piece of Sandal-wood or some roses, a match box, some hairs, a small earthen pot containing embers, and a little resin.

*Teacher*—(Shewing the piece of sandal-wood) You all know this substance?

*Pupil*—It is a piece of sandal-wood.

*Teacher*—Will you smell it? What do you find?

*Pupil*—It has a good smell.

*Teacher*—What are these?

*Pupil*—Hairs.

*Teacher*—I will ignite a match and burn these hairs. You get a smell now, don't you? What sort of smell is this?

*Pupil*—It is a bad smell.

*Teacher*—You all know the smell of a rotten fish or of the rotten body of a dead cat. Don't you? What sort of smell is that?

*Pupil*—A very bad smell.

*Teacher*—You know also the smell of rotten leaves and branches of trees? How does this smell differ from that of the rotten body of a dead cat?

*Pupil*—The smell of rotten leaves is also bad but not so bad as the other.

*Teacher*—Shut up your eyes, will you? (Burning the resin) What is this the smell of?

*Pupil*—It is the smell of resin.

*Teacher*—Will you go to that open spot (pointing to a place in the play ground) and see if there is any smell of any kind there?

*Pupils*—(On arrival at the fixed spot) No smell here.

*Teacher*—Come back to your seats, my boys. Was there any smell in this room before the resin was burnt?

*Pupil*—No Sir.

*Teacher*—This shews that *pure* air has no smell. Whenever therefore you get any smell you must know that there is something else which gives it. What would you call the air which is full of smell of any kind?

*Pupil*—Impure.

*Teacher*—Very good. To breathe air having a bad smell is harmful. You must therefore avoid such air by all means.

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## LESSON XI.

(*On measurement of Length, etc.*)

**Apparatus :** A number of jute sticks.

*Teacher*—Look here, my boys. This is a piece of jute stick ; I am going to break off a part one cubit long.

*Teacher*—Take a stick, every one of you, and do as I have done.

*Teacher*—Let me have your cubit measures. I put them together this way. What do you find?

*Pupil*—The sticks are not equal.

*Teacher*—What does this shew?

*Pupil*—The cubit is not the same for all persons.

*Teacher*—Good. I am now going to break off a part one span (*bighat*) long.

*Teacher*—Will you do the same now? Will you break off another such part? Will you again break off a part one cubit long?



*Teacher*—You have broken off three pieces. Will you now try and see if the two smaller pieces are together equal in length to the larger one?

*Pupil*—It is so.

*Teacher*—What does this shew?

*Pupil*—Two spans make one cubit.

*Teacher*—Good. Look here, I am going to break off a piece four *angulis* long. Now another; what is the length of this?

*Pupil*—Eight *angulis*.

*Teacher*—Now another; what is its length?

*Pupil*—Twelve *angulis*.

*Teacher*—All right. Will you similarly break off three pieces?

*Teacher*—You have now got two groups of sticks. What are the lengths of the sticks in the first group?

*Pupil*—One span, one span and one cubit.

*Teacher*—What in the second group?

*Pupil*—Four *angulis*, eight *angulis*, twelve *angulis*.

*Teacher*—All right. Will you now compare the twelve-*anguli*-stick with either of the span-sticks?

*Pupil*—They are equal?

*Teacher*—What does it shew?

*Pupil*—Twelve *angulis* make one span.

*Teacher*—How many *angulis* make a cubit then?

*Pupil*—Twenty-four *angulis* make a cubit.

*Teacher*—Very good. You must remember then that twelve *angulis* make one span, and two spans or twenty-four *angulis* make one cubit.

*Teacher*—(Spreading a *chadar* on the ground) What is its shape like?

*Pupil*—An oblong.

*Teacher*—Shew me the long sides and the short sides of it.

*Teacher*—The long side is called the *length* and the short side the *breadth* of the *chadar*. See how I measure its *length*. I find the length to be three cubits and two *angulis*. Kedar, will you do the same now and tell me its length?

*Kedar*—It is four cubits and ten *angulis*.

*Teacher*—Gopal, will you measure its *breadth*?

*Gopal*—The breadth is two cubits and six *angulis*.

*Teacher*—Akshoy, will you also measure the breadth?

*Akshoy*—The breadth is two cubits and nine *angulis*.

*Teacher*—Gopal, take this rod and measure off a part three and a half cubits long. Now stand up straight and hold the measured stick by your side. Compare your height with that of the stick.

*Gopal*—They are equal.

*Teacher*—Very good. You can all try this experiment when you go home. Every one will find his height to be three cubits and a half by his *own* measure.

## LESSON XII.

(*On measurement of Length, etc.*)

**Apparatus :** Some mid-ribs of cocoa-nut leaflets, a few pieces of Jute stick, a piece of thread, a brick shaped body, a flat bamboo slip, and a knife.

*Teacher*—This line is exactly *three inches* long.



(Taking one of the mid-ribs) From this stick I will measure off a part equal to that line. What is the length of this bit then?

*Pupil*—Three inches.



*Teacher*—I will now break off a piece whose length is equal to that of two such bits. What is the length of this piece then?

*Pupil*—Six inches.

*Teacher*—I now want a larger piece equal in length to two such pieces. What is the length of this large piece then?

*Pupil*—Twelve inches.

*Teacher*—Good. *One foot* is another name for "twelve inches". What is the length of this stick then?

*Pupil*—One foot.

*Teacher*—Take this foot-stick and measure off three feet from that Jute stick.

*Teacher*—All right. *One yard* is the name for "three feet." What is the length then of the piece that you have measured off?

*Pupil*—One yard.

*Teacher*—(Tearing off a three-inch bit from the piece of thread) What is the length of this bit of thread?

*Pupil*—Three inches.

*Teacher*—Let us divide this bit into three equal parts. What is the length of each part?

*Pupil*—One inch.

*Teacher*—Right. How is an inch related to a foot?

*Pupil*—Twelve inches make one foot.

*Teacher*—How is a foot related to a yard?

*Pupil*—Three feet make one yard.

*Teacher*—(Putting the brick-shaped body with the shortest edges vertical) Which side is the length and which the breadth of the upper face of the brick?

*Teacher*—Right. The length of the brick is the same as the length of this face, and the breadth of the brick is the same as the breadth of this face.

*Teacher*—Look at the standing up edges of the brick. Each of them measure the *thickness* of the brick.

*Teacher*—We have got here a flat bamboo slip. I will measure off one foot from it by means of the foot-stick already prepared. Let me cut off the rest with the knife. Here then is a foot-measure for you. See how I divide it into twelve equal parts and mark the points of division. Will you take this bamboo slip now and measure the length, breadth, and thickness of the brick?

*Teacher*—Very good. I will make a slip like this for every one of you. You will then be able to measure the length, breadth and thickness of various things.

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### LESSON XIII.

#### (On a Chair.)

*Teacher*—What is the name of this thing, my little friend?

*Pupil*—A chair.

*Teacher*—What is it used for?

*Pupil*—It is to sit upon.

*Teacher*—Of what is it made?

*Pupil*—It is made of wood.

*Teacher*—Who has made it?

*Pupil*—The carpenter.

*Teacher*—What other things does the carpenter make?

*Pupil*—Boxes, door-frames, doors, benches, stools, tables, *taktaposhes*, racks.

*Teacher*—How many legs has the chair?

*Pupil*—It has four legs.

*Teacher*—What other things of wood are there in this room, having four legs?

*Pupil*—Stools, tables.



*Teacher*—How do the legs of the chair look.

*Pupil*—The front legs are straight, the hind legs are bent.

*Teacher*—What are these two ?

*Pupil*—These are the hands of the chair.

*Teacher*—What do the hands look like ?

*Pupil*—Like crooked lines.

*Teacher*—Of what use are the hands ?

*Pupil*—They are to rest our hands upon when we sit upon the chair.

*Teacher*—Yes. What if a chair had no hands ?

*Pupil*—It would be less comfortable to sit upon it.

*Teacher*—What is this ?

*Pupil*—The back of the chair.

*Teacher*—Of what use is the back ?

*Pupil*—It is to rest our backs upon when we sit upon the chair.

*Teacher*—What is the difference between sitting upon a stool and sitting upon a chair ?

*Pupil*—To sit upon a chair is more comfortable.

*Teacher*—Of this chair and this stool which is the heavier ?

*Teacher*—Of this chair and this slate which is the smoother ?

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## LESSON XIV.

(*On a Slate and Pencil.*)

**Apparatus :** A slate, a slate-pencil, a slate without the wooden frame, and a *handi*.

*Teacher*—What is the name of this thing ?

*Pupil*—A slate.

*Teacher*—What is it used for ?

*Pupil*—It is to write upon, to draw figures upon.

*Teacher*—What is this ?

*Pupil*—A slate pencil.

*Teacher*—Of what use is it ?

*Pupil*—It is to write upon the slate with.

*Teacher*—What is the form of the pencil ?

*Pupil*—It is like a straight line.

*Teacher*—Of what shape is the slate ?

*Pupil*—It is like an oblong.

*Teacher*—What is this all round the slate ?

*Pupil*—It is the frame.

*Teacher*—Here you have two slates, one with a frame and the other without it. Will you try and tell me which is the more convenient to use ?

*Pupil*—(Holding up the former) This one is the more convenient to use.

*Teacher*—Quite so. The slate has got sharp edges and corners which cannot hurt us if there is a frame like this all round.

*Teacher*—Of what colour is the slate or the pencil ?

*Pupil*—They are both of the black colour.

*Teacher*—When you write upon a slate, of what colour are the marks made ?

*Pupil*—The marks are white.

*Teacher*—What becomes of the pencil after it is used for some time ?

*Pupil*—It becomes smaller in size.

*Teacher*—Of the slate and the pencil which is the softer ?

*Pupil*—The pencil.

*Teacher*—How do you know it ?

*Pupil*—The pencil wears by constant use, but the slate does not.

*Teacher*—Good. What would happen if the slate were thrown upon the ground ?

*Pupil*—It would break.



*Teacher*—What are those things called that are easily broken?

*Pupil*—Brittle.

*Teacher*—Do you find any other thing here which is brittle?

*Pupil*—This *handi*.

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## LESSON XV.

(*On a Book.*)

**Apparatus :** A book, a sheet of paper, a *lotah* of water, a few scraps of paper.

*Teacher*—What have I got in my hand?

*Pupil*—A book.

*Teacher*—I put it upon the table. What is the shape of its top?

*Pupil*—The top is of the oblong shape.

*Teacher*—Of what shape is the whole thing?

*Pupil*—It is shaped like a brick.

*Teacher*—What are these?

*Pupil*—The leaves of the book.

*Teacher*—Are the leaves rough or smooth? Just try, will you?

*Pupil*—The leaves are smooth.

*Teacher*—What is this part of the book called?

*Pupil*—It is the covering of the book.

*Teacher*—Of the covering and the leaves which is the smoother?

*Pupil*—The leaves.

*Teacher*—Of what colour is the covering? What is the colour of the leaves?

*Pupil*—The leaves are white.

*Teacher*—How many sides has each leaf?

*Pupil*—Two sides.

*Teacher*—Each side of a leaf is called a *page*. How many pages are there in three leaves then?

*Pupil*—Six pages.

*Teacher*—How many pages in ten leaves?

*Pupil*—Twenty pages.

*Teacher*—See how I fold this sheet of paper. How many leaves have been formed?

*Pupil*—Two leaves.

*Teacher*—I fold it once more. How many leaves this time?

*Pupil*—Four leaves.

*Teacher*—I fold it again. How many leaves this time?

*Pupil*—Eight leaves.

*Teacher*—I fold it a fourth time. How many leaves now?

*Pupil*—Sixteen leaves.

*Teacher*—The larger the number of folds the smaller is the size of each leaf. Isn't it?

*Pupil*—Yes Sir.

*Teacher*—Do you know the name of the place where books are printed? It is called a *Press*. What is it called?

*Pupil*—A Press.

*Teacher*—Will you tear off this scrap of paper? Is it easy to do so?

*Pupil*—Very easy.

*Teacher*—This shews that you should always handle a book with care, otherwise it may be torn.

*Teacher*—(Wetting one of the scraps) Take this dry scrap and this wet one. Which is the more easily torn?

*Pupil*—The wet scrap.

*Teacher*—What then if your book gets wet?

*Pupil*—It may be easily torn.

*Teacher*—Very good. You must then all take good care of your books.

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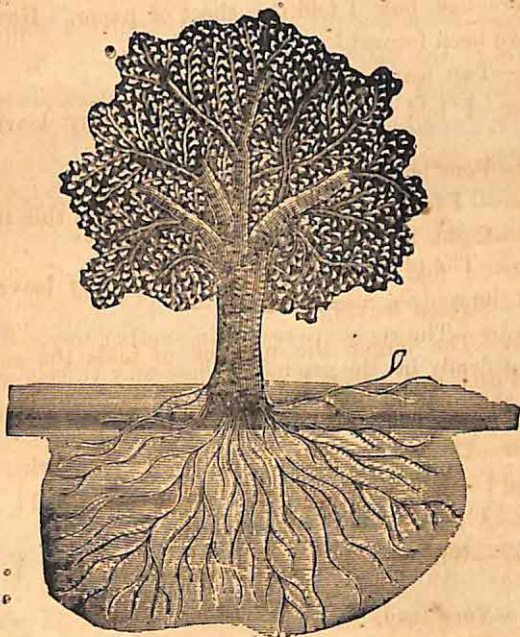


## LESSON XVI.

(*On a Tree and its Fruits.*)

**Apparatus** :—A Young *Bel* plant, and a ripe *Bel*.

**Teacher**—What is this picture of?



**Pupil**—A large tree.

**Teacher**—What are these?

**Pupil**—The roots of the tree.

**Teacher**—How many are the roots?

**Pupil**—The roots are many.

**Teacher**—You learnt last year what this part of the tree is called? What is it called?

**Pupil**—It is the stem.

*Teacher*—Do you know what are these ?

*Pupil*—They are the branches of the tree.

*Teacher*—What are these ?

*Pupil*—The leaves.

*Teacher*—Do you know this thing ?

*Pupil*—It is a young *Bel* plant.

*Teacher*—Point out the roots, the stem, the branches and the leaves of this plant. Will you ?

*Pupil*—These are the roots, this is the stem, these are the leaves. It has no branches.

*Teacher*—Very good. A young plant has no branches. As the plant grows it gradually begins to have branches.

*Teacher*—What does the plant do with its roots ?

*Pupil*—The plant sucks up the watery part of the soil through the roots.

*Teacher*—The roots are useful in another way. They hold the plant firmly in the ground. They may thus be called the legs of the plant. The roots are therefore both legs and mouths of the plant.

*Teacher*—What did we do last year to keep the mango plant in the pot alive ?

*Pupil*—We had to moisten the earth every day with water.

*Teacher*—How are the plants and trees that you see all around kept alive ? What moistens the soil in which they grow ?

*Pupil*—The rain water.

*Teacher*—Very good. What is this ?

*Pupil*—A *Bel*.

*Teacher*—What is its shape ?

*Pupil*—Round.

*Teacher*—Is the fruit green or ripe ?

*Pupil*—It is ripe.

*Teacher*—How do you know it ?



*Pupil*—From its colour which has become yellowish.

*Teacher*—I will break it open. How does the inside look?

*Pupil*—It looks red.

*Teacher*—(Taking out some seeds) What are these?

*Pupil*—They are the seeds of the fruit.

*Teacher*—What happens if we put one of them into a moist ground?

*Pupil*—After sometime a plant will grow out of it.

*Teacher*—What will the plant grow into at last?

*Pupil*—It will grow into a large *Bel* tree.

*Teacher*—We shall get *Bels* from that tree again! We get a seed from the fruit, a plant from the seed, a tree from the plant, and fruits again from the tree! Wonderful!

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## LESSON XVII.

(*On a Mango and Plantain.*)

**Apparatus** :—A number of green and ripe mangoes, a number of green and ripe plantains, and a knife.

*Teacher*—I place these fruits before you, my dear friends. I touch them at random and you tell me the name of the thing I touch.

*Pupil*—A ripe mango, a green plantain, a ripe plantain, a green mango, etc.

*Teacher*—How do the green mango and the green plantain differ in colour?

*Pupil*—They do not differ at all. Both are of the green colour.

*Teacher*—Do the ripe mango and a ripe plantain differ in colour?

*Pupil*—Yes. The colour of the mango is orange but the colour of the plantain is yellow.

*Teacher*—How do they differ in shape?

*Pupil*—The mango looks round but not quite round like a ball. The plantain is longish in this direction and roundish in that.

*Teacher*—Will you try these fruits and tell me which of them are hard and which soft?

*Pupil*—The green fruits are hard, the ripe ones are soft.

*Teacher*—(Taking a ripe mango and peeling it) What am I doing, my boys?

*Pupil*—You are peeling the mango.

*Teacher*—I will give every one of you a slice to eat. What is the taste?

*Pupil*—Sweet and sour both.

*Teacher*—What part of the mango has been thrown away and what part has been eaten?

*Pupil*—The rind has been thrown away and the pulp has been eaten.

*Teacher*—When the pulp is eaten what remains?

*Pupil*—The stone.

*Teacher*—Look, I will peel this ripe plantain now. Which is the easier to peel, the mango or the plantain?

*Pupil*—The plantain.

*Teacher*—Will you taste the plantain now?

*Pupil*—It is all sweet, not sour at all.

*Teacher*—How does the pulp of the ripe mango differ in colour from that of the ripe plantain?

*Pupil*—The pulp of the mango is yellowish, the pulp of the plantain is white.

*Teacher*—Name the different parts of the mango.

*Pupil*—The rind, the pulp, the stone.

*Teacher*—Name the different parts of the plantain.



*Pupil*—The rind, the pulp, the seeds.

*Teacher*—Very good. We will now plant the stone and the seeds in our garden and water them every day to make them grow.

## LESSON XVIII.

(On Seeds.)

**Apparatus :** A number of cocoa-nut-shell-cups ; a number of grains of paddy, wheat, barley, mustard, linseed, gram, and various pulses.

*Teacher*—You see before you, my boys, a number of cocoa-nut-shell-cups with a number of grains in each. As I touch a cup tell me what kind of grains it contains.

*Pupil*—Linseed, gram, paddy, wheat, barley, etc.

*Teacher*—Point out the seeds that give oil. What are the things that paddy gives us ?

*Teacher*—How does a grain of mustard differ from a grain of linseed in shape and colour ?

*Teacher*—What are the uses of the mustard oil ?

*Teacher*—How are the pulses used ?

*Teacher*—What do we get from wheat, and what from barley ?

*Teacher*—The other day, you remember, I put some paddy grains into a cup of water. Harish, will you bring that cup from its place ? How do the grains look ?

*Pupil*—The grains have become larger in size and something seems to have come out from each !

*Teacher*—The thing that has come out is called the *sprout*. It is this sprout that gradually grows into a plant.

*Teacher*—We shall now try and see if the different seeds that we have before us will give sprouts if similarly placed.

## LESSON XIX.

*(On Grass.)*

**Apparatus :** A number of grass plants, a knife, some paddy plants, some cocoa-nut-shell-cups and water.

*Teacher*—I will give a grass plant to every one of you. Examine it carefully. How are its roots ?

*Pupil*—They are white (or grey) in colour and thin like hair.

*Teacher*—Do you see the stem of the plant, the branches and the leaves ?

*Pupil*—No branches are seen, the stem and the leaves only are seen.

*Teacher*—What colour are the stem and the leaves ?

*Pupil*—They are both of the green colour.

*Teacher*—What shape are the leaves ?

*Pupil*—They are long and narrow.

*Teacher*—What do you find at those places on the stem from which the leaves grow ?

*Pupil*—Knots.

*Teacher*—I will cut open the stem. How does the inside look ?

*Pupil*—It is hollow.

*Teacher*—Yes. A grass plant is like a bamboc.

*Teacher*—I will now give every one of you a paddy plant. Will you compare the two ?

*Pupil*—The roots are alike. The stems are alike. The leaves are of the same shape.

*Teacher*—How are the stems alike ?

*Pupil*—The stem of the paddy plant is hollow too and has knots in it.

*Teacher*—What is the difference between a paddy plant and a grass plant then ?



*Pupil*—The paddy plant is larger than the grass plant.

*Teacher*—(Taking some grass plants having flowers) What do you find on the tops of these plants?

*Pupil*—A number of very small round balls of green colour.

*Teacher*—These are the flowers of the plant!

*Teacher*—What animals have you seen feeding on grass?

*Pupil*—Horses, cows, goats, sheep and buffaloes.

*Teacher*—Besides being food to so many animals the grass is useful in another way. It keeps the ground cool. The sun-shine makes the bare ground more heated than the ground on which there is grass. A grassy spot is also very beautiful to look at.

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## LESSON XX.

(On the Jute Plant.)

**Apparatus :** A Jute plant, a bunch of Jute, a number of Jute plants rotted in water, some *Malshas* and water.

*Teacher*—(Placing the Jute plant before the pupils) Last year you had a lesson on jute stick. The jute stick is no other than the wood of the plant that now lies before you.

*Teacher*—What is this?

*Pupil*—A bunch of Jute.

*Teacher*—Do you know where do these thread-like things come from? They come from the bark of plants like the one before you.

*Teacher*—Here are a few jute plants which have rotted, being kept under water for some days. I will give one of these rotted plants to each of you, and keep one with me. See how I strip off its bark. Do as I do.

*Teacher*—Let every one take a *malsha* of water and wash his own strips. Do as I do.

*Teacher*—Done. Now let us put our strips in the sunshine to dry. When the strips become dry they will look the same as this bunch of jute.

*Teacher*—(Taking out a fibre from the bunch) What is this, my boy?

*Pupil*—A fibre of Jute.

*Teacher*—Just see if you can tear it.

*Pupil*—It is torn most easily.

*Teacher*—I will now give you not one fibre but a number of fibres. Try to tear them together.

*Pupil*—I fail to do so.

*Teacher*—Gopal, you hold this bundle at one end. Kedar, you hold it at the other. Now pull it and tear it if you can.

*Pupils*—We fail.

*Teacher*—You see then that a single fibre can be easily torn, but when a number of them are put together they form a *strong* bundle.

*Teacher*—I will show you now how ropes are made from jute.

*Teacher*—You must henceforth try to find out what things are made of jute, as also the various ways in which such things are used.

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## LESSON XXI.

(*On Parts of the Human Body.*)

*Teacher*—Nabin, will you come to me? (Covering Nabin's hair with a *Chadar*) Which part of Nabin's head do you find covered, my boys?

*Pupil*—The hair.



*Teacher*—Which part of the head has *not* been covered ?

*Pupil*—The face.

*Teacher*—Yes. What smaller parts of the body does the face contain ?

*Pupil*—The nose, the eyes, the ears, the mouth.

*Teacher*—Good. Will you now all put your right hands upon your *foreheads* ?

*Teacher*—Shew your *eye brows*. How many eye brows have you each ?

*Teacher*—Shew your *eyelids*. How many eyelids have you each ?

*Teacher*—Shew your *eye lashes*. How many eye lashes have you each ?

*Pupils*—Two eye lashes.

*Teacher*—Shew your *cheeks*. How many cheeks have you each ?

*Teacher*—Shew your *chins*. How many chins have you each ?

*Pupils*—One.

*Teacher*—Shew your *lips*. How many lips have you each ?

*Teacher*—Open your *mouths* this time. Shew your *tongues*. Shew your *teeth*. How many rows of teeth have you each ?

*Teacher*—If you look at any body's *face* what do you find besides the nose, the eyes and the ears ?

*Pupil*—The forehead, the eye brows, the eyelids, the eye lashes, the cheeks, the chin and the lips.

*Teacher*—What do you find within the mouth ?

*Pupil*—The tongue and the teeth.

*Teacher*—Very good.

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## LESSON XXII.

(On Parts of the Human Body).

*Teacher*—Nobin, come to me. Will you? Which part of Nobin's body is this?

*Pupil*—The neck.

*Teacher*—What are these!

*Pupil*—The Shoulders.

*Teacher*—Will you each put your right hand upon your left shoulder and the left hand upon the right shoulder?

*Teacher*—What are these?

*Pupil*—The armpits.

*Teacher*—Will you put your right hand into your left armpit and the left hand into the right armpit?

*Teacher*—Shew your wrists. How many wrists have you each?

*Teacher*—Look here, this is Nobin's right arm, this is Nobin's left arm. Which part of the body is called the arm then?

*Pupil*—The part from the armpit to the wrist is called the arm.

*Teacher*—What are at the ends of the arms?

*Pupil*—The hands.

*Teacher*—Very good. Will you now all do as I tell you? Hold up your right arms. Hold up your left arms. Hold up both the arms. Shew your left elbow by the right hand. Shew your right elbow by the left hand. Stand up straight with the right hand upon the breast and the left hand upon the belly. Shew your waist by the right hand and the back by the left. Shew your right thigh by the right hand and the left thigh by the left hand. Shew your right knee by the right hand and the left knee by the left hand. Shew your right ankle by the right hand and the left ankle by the left hand.



*Teacher*—Which part of the body is called the *leg*?

*Pupil*—The part from the knee to the ankle is the leg.

*Teacher*—Good. Will you now all stand up and shew the parts of the body that I name? The head, the neck, the right eye, the left ear, the right cheek, the tongue, the left shoulder, the left arm, the right armpit, the left elbow, the breast, the waist, the left thigh, the right leg, the left ankle.

*Teacher*—Very good. You will have an exercise of this kind from time to time.

### LESSON XXIII.

(*On a Cat.*)

*Apparatus* :—A tame cat and some water.

*Teacher*—What is this the picture of?



*Pupil*—A cat.

*Teacher*—What kind of animal is a cat?

*Pupil*—A beast.

*Teacher*—How many legs has the cat?

*Pupil*—Four legs.

*Teacher*—(Shewing the whiskers) what are these?

*Pupil*—The *whiskers*.

*Teacher*—Let me put my forefinger successively on the different parts of the cat's body in this picture; will you name the parts as I touch them?

*Pupil*—The head, the tail, the eyes, the ears, the neck, the back, the belly, the mouth, the legs, the feet.

*Teacher*—What is the form of the cat's head?

*Pupil*—Round.

*Teacher*—What is it that the cat has, but a man has not?

*Pupil*—The tail.

*Teacher*—What is it that a man has, but a cat has not?

*Pupil*—The hands.

*Teacher*—In what other way does the body of a cat differ from the body of a man?

*Pupil*—The cat's body is covered with *fur* which a man has not.

*Teacher*—Look at the *pupils* of its eyes (putting the tame cat before the children). How do they differ from those of any of you?

*Pupil*—The *pupils* of the cat's eyes are long and narrow. Our *pupils* are round.

*Teacher*—Very good. Will you count the *toes* that the cat has on each foot?

*Pupil*—Five toes on each front foot. Four toes on each hind foot.

*Teacher*—(After caressing the cat a little) Will you feel the undersurfaces of her feet?

*Pupil*—They are very soft.

*Teacher*—Yes. These soft things are called *pads*. Do you find the *claws* at the ends of her toes?

*Pupil*—No Sir.

*Teacher*—(Exciting her temper) Do you find the claws now?

*Pupil*—Yes Sir.



*Teacher*—What do you learn from this?

*Pupil*—The claws are hidden when the cat is in good temper, but they come out when she is angry.

*Teacher*—Good. I will now throw a little dust on the cat's body. What is she doing?

*Pupil*—She has been trying to shake off the dust. How she licks the body!

*Pupil*—She is cleaning her body with the tongue. She always likes to be clean. The cat has therefore a very good lesson to teach you. You must always try to be neat and clean like the cat.

*Teacher*—Let the cat lie down still for some time. Don't trouble her. Silently watch the cat's ears as I make a sound. What do you find?

*Pupil*—Her ears have stood up erect!

*Teacher*—What is the difference then between our ears and those of the cat?

*Pupil*—The cat can move her ears. We cannot move ours.

*Teacher*—Very good.

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## LESSON XXIV.

(On Drawing).

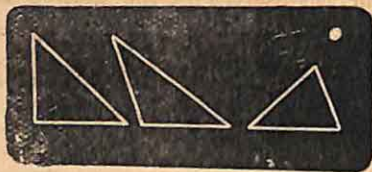
*Teacher*—What are these that I have drawn on your slate, my young boy?



*Pupil*—A right angle, an obtuse angle, and an acute angle.

*Teacher*—Will you do as I have done? Draw a right angle below the right angle, an obtuse angle below the obtuse angle, and an acute angle below the acute angle.

*Teacher*—What have I drawn now?



*Pupil*—Three isosceles triangles.

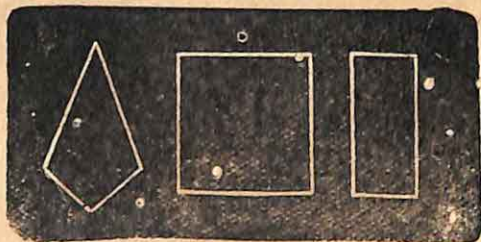
*Teacher*—Do they differ from one another in any way?

*Pupil*—Yes. The first has one right angle and two acute angles. The second has one obtuse angle and two acute angles. The third has three acute angles.

*Teacher*—Very good. The first is called a *right angled* triangle; the second, an *obtuse angled* triangle; and the third, an *acute angled* triangle.

*Teacher*—Will You do as I have done? Below each triangle make a copy of it.

*Teacher*—What have I drawn now?



*Pupil*—A quadrilateral, a square, and an oblong.



*Teacher*—Below each figure make a copy of it. Will you, my good little friends?

*Note*.—In a similar way the children are to be taught to draw various Geometrical figures. After having had a good exercise in the drawing of such figures they will be able to invent forms for themselves by the placing of sticks in the manner indicated in Lesson XX, Chapter V; as soon as he constructs a form the child shall copy it on his slate.

## LESSON XXV.

(On Drawing.)

*Apparatus*: Leaves of various plants.

*Teacher*—I have brought a number of leaves for you, my little friends. I want to see if you know them. Tell me the name of each leaf as I shew it to you.

*Pupil*—A Banyan leaf, a jack leaf, a plum leaf, a mango leaf, a lemon leaf.

*Teacher*—Take this Banyan leaf, will you? Place it first of all on the table and press it so that it may lie quite flat.

*Teacher*—Now place it on your slate in the following manner:—



*Teacher*—Now hold it with your left hand and trace its outline by the pencil.

*Pupil*—Here it is !



*Teacher*—Very good. Will you *similarly* trace the outline of each of the other leaves ?

*Teacher*—Will you trace the outline of a jack leaf ? Will you now make a *copy* of it by its side ?

*Teacher*—Very good. Examine your copy now. Place the leaf over it and see how the copy differs from the original. If you find any defect, correct it.

**Note.** This method of comparing the copy with the original will not only help in training the eye but will also fix the form of the original more clearly in the mind.



## LESSON XXVI.

(On the writing of the letters of the Alphabet.)

**Apparatus:** A number of tamarind seeds for each child.

*Teacher*—I will write an *aw* (অ) upon your slate, my good lad.

অ

What do you call it?

*Pupil*—*Aw*.

*Teacher*—Good. Will you now place your seeds over it?

*Pupil*—Done!



*Teacher*—Now make a copy of the letter, my little chap.

*Pupil*—This is the copy, Sir.

অ

*Teacher*—Very good.

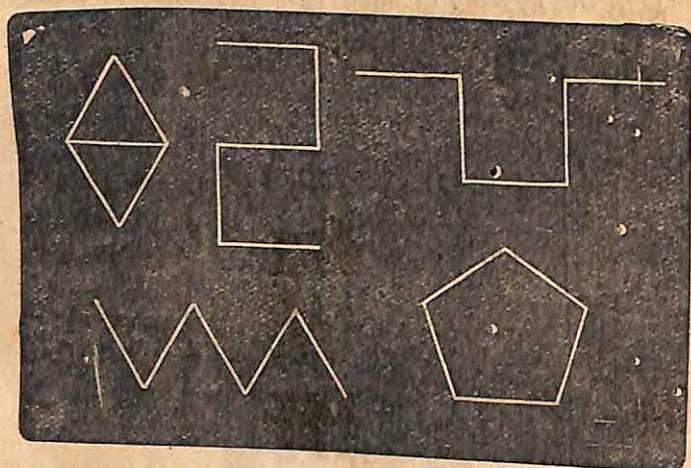
[In a similar way the children are to be taught to write successively all the letters of the alphabet.]

## LESSON XXVII.

(On Stick Laying.)

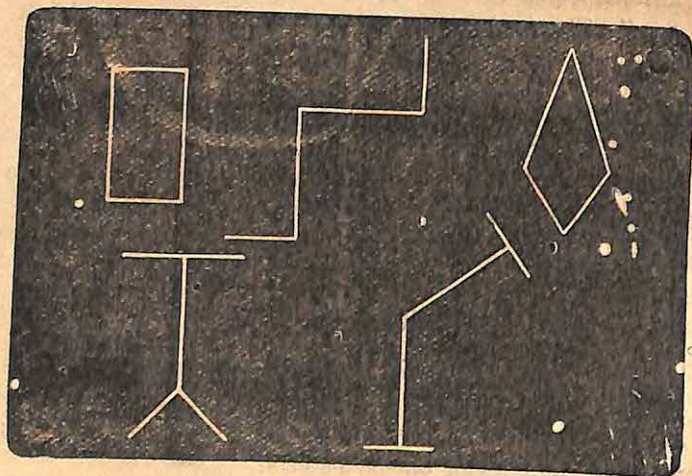
**Apparatus:** A number of bundles of three-inch-sticks; a number of bundles of one-inch-sticks.

*Teacher*—The following are some of the forms that may be constructed with five equal sticks :—



Will you make a copy of each of these figures with your own sticks ?

*Teacher*—The following are some of the forms which may be constructed with two long sticks and two short ones :—





Will you make a copy of each of these figures with your own sticks?

**Note.** After the children have had some exercises of this kind they will be able to invent various forms for themselves, and this occupation will gradually become more and more attractive to them.

## LESSON XXVIII.

(*On Notation up to 100.*)

*Teacher*—My little friends, you all know how to write the numbers from one to nine. I am going to teach you to-day how to write the numbers from ten to one hundred?

*Teacher*—What do you find on the board?

10

*Pupil*—One with a zero after it.

*Teacher*—Yes. This is how *ten* is written. To write *ten* is to write *one* with a zero after it. Will you each write *ten* on your slates now?

*Teacher*—*One ten* is written with a zero after one. Is n't it? What do you now find on the board then?

20

*Pupil*—*Two tens.*

*Teacher*—Very good. Will you each write *three tens* on your slates? Will you now write *ten tens*?

*Pupil*—Here it is.

100

*Teacher*—Excellent. *One hundred* is another name for *ten tens*. Remember then that one hundred is to be written with *two zeros* after one.

*Teacher*—What are the names for “two tens”, “three tens”, etc. ?

Twenty, thirty, forty, etc.

*Teacher*—Read the numbers written on the board :—

30,     50,     80,     100.

*Pupil*—Thirty, fifty, eighty, one hundred.

*Teacher*—Good. What is written on the board now ?

11

*Pupil*—One after one.

*Teacher*—This means one ten and one.

*Teacher*—What are now written on the board then ?

12,     35,     89.

*Pupil*—One ten and two, three tens and five, eight tens and nine.

*Teacher*—Very good. What are the short names for these numbers ?

*Pupil*—Twelve, thirty five, eighty nine.

*Teacher*—Very good. Read the numbers written on the board.

24,     37,     53.

*Pupil*—Twenty four, thirty seven, fifty three.

*Teacher*—Will you now write all the numbers from eleven to one hundred ?

*Pupil*—Here they are :—

11,     12,     13,     14,     15,  
16,     17,     18,     19,     20,

&c.

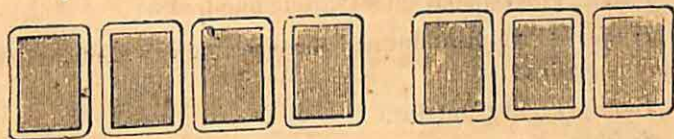
*Teacher*—Very good, my little friends.



## LESSON XXIX.

(On Addition.)

*Teacher*—Here you have two rows of slates, my boys.  
How many in each?



*Pupil*—Three in the first row and four in the second.

*Teacher*—Will you count and tell me how many are they in all?

*Pupil*—One, two, three, four, five, six, seven. *Seven* in all.

*Teacher*—Three slates and four slates together make *seven* slates. Isn't it? Three mangoes and four mangoes will make how many mangoes then?

*Pupil*—Seven mangoes.

*Teacher*—Three jacks and four jacks will make how many jacks?

*Pupil*—Seven jacks.

*Teacher*—Very good. You see then that *three and four* make *seven*.

*Teacher*—Here you have two rows of inkstands:—



How many in each?

*Pupil*—Five in the first row and three in the second.

*Teacher*—Will you count and tell me how many are they in all?

*Pupil*—One, two, three, four, five, six, seven, eight. Eight in all.

*Teacher*—Five apples and three apples will make how many apples then?

*Pupil*—Eight apples.

*Teacher*—Five plantains and three plantains will make how many plantains?

*Pupil*—Eight plantains.

*Teacher*—You see then that *five and three make eight*.

**Note.** Having introduced the subject in various ways of this kind the children are to be gradually made to get by heart the following tables of addition :—

### FIRST TABLE OF ADDITION.

	১	২	৩	৪	৫	৬	৭	৮	৯	১০
আর ১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১
আর ২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২
আর ৩	৪	৫	৬	৭	৮	৯	১০	১১	১২	১৩
আর ৪	৫	৬	৭	৮	৯	১০	১১	১২	১৩	১৪
আর ৫	৬	৭	৮	৯	১০	১১	১২	১৩	১৪	১৫
আর ৬	৭	৮	৯	১০	১১	১২	১৩	১৪	১৫	১৬
আর ৭	৮	৯	১০	১১	১২	১৩	১৪	১৫	১৬	১৭
আর ৮	৯	১০	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮
আর ৯	১০	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯
আর ১০	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০



SECOND TABLE OF ADDITION.

	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০
আর ১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০	২১
আর ২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০	২১	২২
আর ৩	১৪	১৫	১৬	১৭	১৮	১৯	২০	২১	২২	২৩
আর ৪	১৫	১৬	১৭	১৮	১৯	২০	২১	২২	২৩	২৪
আর ৫	১৬	১৭	১৮	১৯	২০	২১	২২	২৩	২৪	২৫
আর ৬	১৭	১৮	১৯	২০	২১	২২	২৩	২৪	২৫	২৬
আর ৭	১৮	১৯	২০	২১	২২	২৩	২৪	২৫	২৬	২৭
আর ৮	১৯	২০	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮
আর ৯	২০	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮	২৯
আর ১০	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮	২৯	৩০

## LESSON XXX.

*(Exercises in Mental Arithmetic.)*

1. What are 2 and 2, 3 and 3, 4 and 4, 5 and 5, 6 and 6, 7 and 7, 8 and 8, 9 and 9, 10 and 10?
2. What are 3 and 2, 5 and 4, 6 and 8, 9 and 3, 8 and 5, 9 and 7, etc.?
3. Four and what will make seven? Five and what will make twelve? Seven and what will make thirteen? etc.
4. What are 11 and 2, 21 and 2, 31 and 2, etc.?
5. What are 15 and 3, 25 and 3, 35 and 3, etc.?
6. What are 16 and 4, 26 and 4, 36 and 4, etc.?
7. What are 13 and 5, 23 and 5, 33 and 5, etc.?
8. What are 3 and 7, 13 and 7, 23 and 7, etc.?
9. What are 2 and 2? 4 and 2? 6 and 2? etc.
10. What are 3 and 2? 5 and 2? 7 and 2? etc.
11. What are 2 and 3? 5 and 3? 8 and 3? etc.
12. What are 3 and 3? 6 and 3? 9 and 3? etc.
13. What are 4 and 4? 8 and 4? 12 and 4? etc.
14. What are 5 and 5? 10 and 5? 15 and 5? etc.
15. Seven mangoes with how many more will make ten mangoes?
16. Eleven jacks with how many more will make eighteen jacks?



## LESSON XXXI.

*(On Subtraction.)*

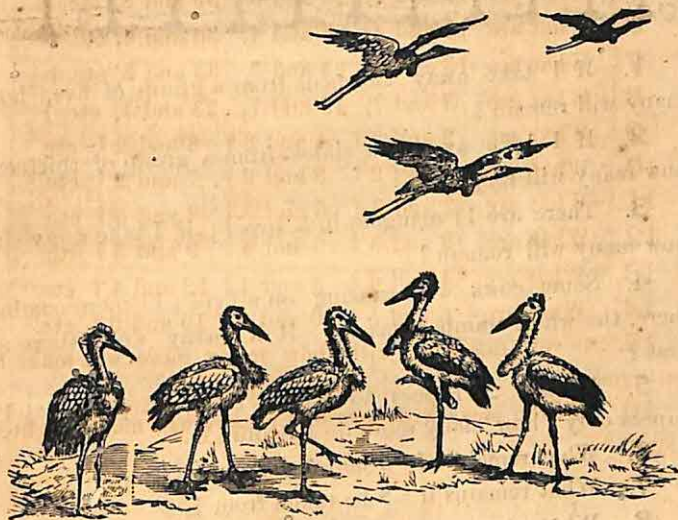
*Teacher*—Three and what will make eight?

*Pupil*—Five.

*Teacher*—Eight adjutants are sitting by the side of a pond. If three of them fly away, how many will remain?

*Pupil*—Five will remain.

*Teacher*—Look here, three of them are flying away and five are still there!



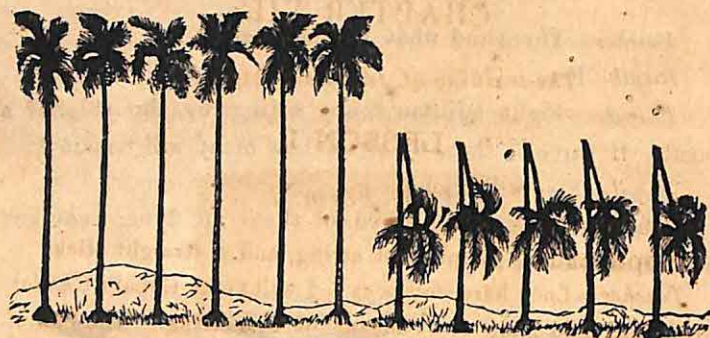
*Teacher*—Five and what will make eleven?

*Pupil*—Six.

*Teacher*—There were eleven betel-nut trees in a garden. Five of them have been broken by storm. How many are there still?

*Pupil*—Six.

*Teacher*—Quite so. Here are the five trees that have been broken and the six that remain !



1. If I take away two pens from a group of five, how many will remain ?
  2. If I take away six slates from a group of thirteen, how many will remain ?
  3. There are 11 mangoes in a vessel ; if I take away six, how many will remain ?
  4. Some cows were grazing on a field ; 11 more coming there, the whole number was 19. How many were there at first ?
  5. I want 25 rupees to buy a thing. I have got 17 rupees only ; how many more do I require ?
  6. What remains if 5 be taken from 9 ?
  7. What remains if 8 be taken from 15 ?
  8. What remains if 7 be taken from 16 ?
  9. What remains if 5 be taken from 17 ?
  10. What remains if 15 be taken from 22 ?
-



## CHAPTER VII.

### *The training of Infants—Stage III.*

#### LESSON I.

(*On Form.*)

**Apparatus :** A piece of string, and a straight stick.

*Teacher*—Look here, my boys. I will make Gopal's *Chadar* into a ball and hang it by means of this string. The ball of *Chadar* is tied to the lower end of the string, the upper end of which is in my hand. How does the string lie?

*Pupil*—It is standing up straight.

*Teacher*—Quite so. When a string stands up like this, it is said to be in a *vertical* position.

*Teacher*—In what position is the surface of water in a tank?

*Pupil*—Lying down position.

*Teacher*—Good. "Horizontal" is the word that we use in such a case. The surface of water in a tank is thus said to be in a *horizontal* position. Remember well, my boys, the position of the string with a ball of *Chadar* at its end, and the position of the surface of water in a tank. The first of these positions is the *vertical* position and the other, the *horizontal* position.

*Teacher*—Look at the surface of the table. What is its position?

*Pupil*—Horizontal.

*Teacher*—Look at the posts of this house. What are their positions?

*Pupil*—Vertical.

*Teacher*—How have I held the stick ?

*Pupil*—Vertically.

*Teacher*—(Holding the stick parallel to the surface of the table) How have I held it now ?

*Pupil*—Horizontally.

*Teacher*—Good. Look at these four lines on the board :—



How do they lie ?

*Pupil*—The first lies vertically ; the second, horizontally. The third is inclined to the left, the fourth is inclined to the right.

*Teacher*—Very good. The 3rd and 4th lines being neither vertical nor horizontal are said to be *oblique*.

*Teacher*—I will draw two lines on your slate.



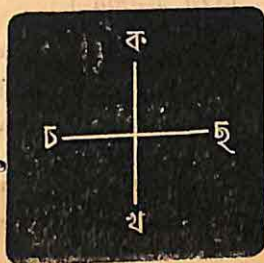
What angle do the lines form ?

*Pupil*—A right angle.

*Teacher*—When two lines form a right angle, as these two lines do, either of them is said to be *perpendicular* to the other.

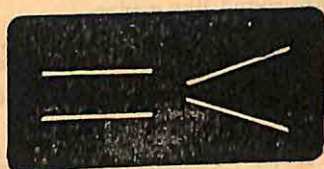


*Teacher*—How are the two lines क ख and ङ related ?



*Pupil*—Either of them is *perpendicular* to the other.

*Teacher*—Very good. I draw four lines on the board now.



How do the first two lines differ from the second two ?

*Pupil*—The space between the first two lines is equally broad everywhere. The space between the second two is narrow on the left and broad on the right.

*Teacher*—Very good. Any two lines like the first two are said to be *parallel* lines. Any two lines like the second two are said to be *oblique* lines.



## LESSON II.

*(On Form.)*

**Apparatus :** A ball, a cylinder, a prism on a triangular base, a prism on a square base, a pyramid on a triangular base, a pyramid on a square base, and a right cone ; all made of clay.

*Teacher*—(Putting the ball and the cylinder before the children) Will you compare the forms of these two things, my young lads ?

*Pupil*—This is round on all sides. This is round in one direction only and it has two flat ends.

*Teacher*—How do the flat ends look ?

*Pupil*—They are round like a pice.

*Teacher*—(Holding up the cylinder) Is there any thing else in this room which is like this in shape ?

*Pupil*—The rule.

*Teacher*—A thing of this shape is called a *cylinder*. I put the cylinder with one of its flat ends in contact with the ground. How do the top and the curved Surface lie ?

*Pupil*—The top lies horizontally, the curved surface lies vertically.

*Teacher*—Here is a *triangular prism*. I put it by the side of the cylinder. How many faces has the prism ?

*Pupil*—Five faces ?

*Teacher*—Describe the faces.

*Pupil*—The upper and lower faces are triangular and they lie horizontally. The other three faces are oblong and they lie vertically.

*Teacher*—Here is another *prism* whose top and bottom are squares. Will you describe this thing ?

*Pupil*—It has six faces. The upper and lower faces are square and they lie horizontally. The other four faces are oblong and they lie vertically.



*Teacher*—Very good. Here you have two *pyramids*, one having a triangular bottom and the other a square bottom. Compare these two pyramids, will you?

*Pupil*—The top of each is a mere point. The bottom of the first is a triangle; that of the second, a square. Besides the bottom, the first has *three other faces* which are triangular and oblique. Besides the bottom, the second has *four other faces* which are triangular and oblique.

*Teacher*—Very good, my little boy. Here is a *cone* for you. Will you describe it?

*Pupil*—Its top is a mere point, the bottom is round like a pie. Its curved surface is oblique. Its shape is like the top of a *mocha* (the blossoms of a plantain tree).

*Teacher*—Very good. A cylinder may be cut out into a *prison* and a cone into a pyramid. It is for you, my young lads, to find out how this can be done.

### LESSON III.

#### (On Colour.)

**Apparatus :** A box of paints ; some porcelain cups ; a few pieces of rag ; water ; flowers, threads, and bits of papers of various colours.

*Teacher*—(Preparing a strong solution of the red paint). Let us soak a piece of rag in this.

*Teacher*—This is an empty cup. I will put into it a little of that solution. What am I doing *now* ?

*Pupil*—You are pouring water into it.

*Teacher*—Yes. I am simply pouring water into this cup. Let us have another rag soaked in this. Will you put these two pieces of wet rag in the sun-shine to dry ?

[The teacher is then to repeat the same process with the yellow and the blue paints.]

*Teacher*—The red rags must have dried now. Will you bring them to me? I place the two rags before you. Do they differ in colour?

*Pupil*—Yes Sir. One is more red than the other.

*Teacher*—Quite so. The colour of the first is *deep* red; and that of the second, *light* red.

*Teacher*—How do the yellow rags differ in colour?

*Pupil*—The colour of the first is *deep* yellow, that of the second is *light* yellow.

*Teacher*—How do the blue rags differ in colour?

*Teacher*—How does a *deep* colour become *light*?

*Pupil*—By the addition of water.

*Teacher*—Very good.

*Teacher*—Do you know how the *orange* colour is produced? It is produced by mixing red with yellow. Let us try the experiment.

*Teacher*—We can similarly produce green by mixing yellow with blue, and indigo by mixing blue with red. We will try these experiments too.

*Teacher*—The colour which is produced by mixing *deep* blue with *light* red is called the *violet* colour. Let us try this experiment now.

*Teacher*—What are the colours of these four rags?

*Pupil*—Orange, green, indigo, violet.

*Teacher*—Very good. You must remember how these colours have been produced, and you can try similar experiments at home with your own boxes of paints?

*Teacher*—You have to pass an examination now, my dear boys. You see before you some flowers, some threads, and some bits of paper. I will hold up one thing at a time and you will have to tell me the colour of it.

*Teacher*—Very good.

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## LESSON IV.

(On the four Cardinal points.)

**Apparatus :** Two strings each about ten cubits long, a *dao*, and four bamboo pins.

**Note.** About the 9th of *Aswin* and the 9th of *chaitra* the sun rises exactly from the east and sets on the west. This lesson should therefore be taken up a little after sun rise or a little before sun set on or about either of these two days.

**Teacher**—(Taking the children to an open space in the school compound) Will you all stand up in a line one behind another facing the sun ?

**Teacher**—Now stretch out your right arms towards the right and left arms towards the left.

**Teacher**—Imagine a big circle around you, my boys, the circle in which the sky seems to meet the earth. This circle is called the *Horizon*. The spot on the *Horizon* from which the sun appears to rise is the *East point* ; the spot just opposite to that, that is the spot where the sun will set, is the *west point*. The spot towards which your right arms stretch out is the *South point*, and the spot towards which your left arms stretch out is the *North point*.

**Teacher**—See how I place this string on the ground by your sides. If the string were extended sufficiently far on both sides where would it meet the horizon ?

**Pupil**—At the *East* and *West* points.

**Teacher**—Very good. I am now going to drive pins into the ground at the ends of the string. *Ram*, will you go and stand near the pin at the *east* end of the string ? *Jadu*, will you go and stand near the pin at the *west* end of the string ?

**Teacher**—Take down your arms now and cease to stand in a line. I have got another string. *Akshoy* and *Madhu*, hold this at its ends and stretch it on the ground at *right angles* to the

former ; and let the two strings divide each other into two equal parts. Now I will put pins at the ends of this string too.

*Teacher*—*Ram* and *Jadu*, hold your string tight ; I am going to cut out a groove along it. *Akshoy* and *Madhu*, do the same ; I am going to cut a groove along this string too.

*Teacher*—How are the two grooves related to each other ?

*Pupil*—They are *perpendicular* to each other.

*Teacher*—Good. How would you name the two grooves ?

*Pupil*—The first groove may be called the *east and west groove*, the second one may be called the *north and south groove*.

*Teacher*—Very good. (Putting a child's table at the junction of the two strings) Now my boys, do as I tell you. *Kedar*, will you go and stand near the *east pin* ? *Hari*, will you go and stand near the *west pin* ? *Gopal*, will you go and stand near the *north pin* ? *Haren*, will you go and stand near the *south pin* ? *Jiten*, will you stand up on the table ?

*Teacher*—*Hari*, in which direction do you find *Jiten* ?

*Hari*—Towards the east.

*Teacher*—*Kedar*, in which direction do you find *Jiten* ?

*Kedar*—Towards the west.

*Teacher*—*Haren*, in which direction do you find *Jiten* ?

*Haren*—Towards the north.

*Teacher*—*Gopal*, in which direction do you find *Jiten* ?

*Gopal*—Towards the south.

*Teacher*—You all stand up now with your faces towards the north. Which point of the horizon is on your right ?

*Pupils*—The east point.

*Teacher*—Which point is on your left ?

*Pupils*—The west point.

*Teacher*—Which point is behind you ?

*Pupils*—The south point.



*Teacher*—The point in the horizon midway between the north and east points is called the *north east point*. The point mid-way between the north and west points is called the *north-west point*. The point midway between the south and west points is called the *south west point*. The point midway between the south and east points is called the *south east point*.

*Teacher*—*Jiten*, will you stretch out your right arm towards the north-east and left arm towards the south-west? Will you all see now if *Jiten* has done as I told him to do?

*Teacher*—Will *Jiten* now stretch out his right arm towards the south-west and left arm towards the north-east? Will you all see now if *Jiten* has done as I told him to do?

*Teacher*—*Jiten*, come down. Let *Nikhil* go and stand up on the table now. *Nikhil*, stand up with your face towards the south-east.

*Teacher*—*Akshoy*, which point is on the right of *Nikhil*?

*Akshoy*—The south-west point.

*Teacher*—*Jiten*, which point is on the left of *Nikhil*?

*Jiten*—The north-east point.

*Teacher*—*Ashu*, which point is behind *Nikhil*?

*Ashu*—The north-west point.

*Teacher*—Very good. Which point is opposite to the south-west point?

*Pupil*—The north-east point.

*Teacher*—Which point is opposite to the north-west point?

*Pupil*—The south-east point.

*Teacher*—Good. You all stand up now with your faces towards the north. Turn immediately towards the point I name: west, north-east, south, north, south-west, east, west, south-east, north-west, north-east, south-west.

*Teacher*—If you stand up facing the south and gradually turn yourself round from left to right, in what order will the points of the horizon successively appear?

*Pupil*—South-west, west, north-west, north, north-east, east, south-east.

*Teacher*—Which would be the order if you were to turn from right to left?

*Pupil*—South-east, east, north-east, north, north-west, west, south-west.

*Teacher*—Very good.

## LESSON V.

### (On Weights.)

**Apparatus:** An ordinary balance with the following counterpoises—a *seer*, a *half seer*, and a *poah*; a few lumps of dry clay; and about half a seer of mustard grains.

*Teacher*—Look here. This is an ordinary *balance*, and these are its *counterpoises*. You must have seen these things at a *Mudi's* shop.

*Teacher*—Let us see if the weight of this lump of clay is greater or less than the weight of this one seer counterpoise. Is the *beam* of the balance horizontal? Which way is it inclined?

*Pupil*—It is inclined towards the lump of clay.

*Teacher*—What does it shew?

*Pupil*—The lump of clay is heavier than the counterpoise.

*Teacher*—If the lump of clay were just as heavy as the counterpoise what would happen?

*Pupil*—The beam would be horizontal.

*Teacher*—Very good. Will you weigh out a lump which is just as heavy as the half-seer counterpoise?

*Teacher*—Good. Put this lump and the half-seer counterpoise on one pan and the one-seer counterpoise on the other. Hold up the balance now. What do you find?

*Pupil*—The beam is horizontal!



*Teacher*—What does it shew?

*Pupil*—Two half-seers are equal to one seer.

*Teacher*—This is a *poah*. Two *poahs* make half a seer.

Prove this.

*Teacher*—(After the relation between a *poah* and half a seer has been proved) How many *poahs* make a seer then?

*Teacher*—What are half a seer and a *poah* equal to?

*Pupil*—Three *poahs*.

*Teacher*—I want a mass of clay weighing one seer and three *poahs*. Let me have it.

*Teacher*—If you had the one seer counterpoise only, how would you give me a mass of clay weighing *two seers*?

*Pupil*—I would first weigh out a lump whose weight is one seer. I would then place this lump and the counterpoise on one pan and the thing to be weighed on the other.

*Teacher*—Very good. Here is a quantity of mustard grains. Divide it into two equal parts with the aid of the balance.

*Teacher*—Very good. You haven't got a half *poah* counterpoise, but I want half a *poah* of mustard grains. Let me have it.

*Teacher*—Very good. Shop keepers often use counterpoises made of brick bats or stones with the object of cheating their customers. Such things are easily worn by scraping; a dishonest shop-keeper may therefore lessen their weights greatly. In that case if you buy a seer of rice, the actual quantity received is less than a seer.

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## LESSON VI.

(On the measurement of Liquids.)

**Apparatus :** An ordinary balance with counterpoises, a small *handi*, small lumps of clay, an earthen glass, a knife, and water.

*Teacher*—I want a *poah* of water. How am I to get it ? Shall I put water on one pan of the balance and the *poah* counterpoise on the other ?

*Pupil*—Water cannot be put on the pan. It must be put into a vessel like a *handi*.

*Teacher*—Yes. Let me put this *handi* on one pan and some lumps of clay on the other. What do you find ?

*Pupil*—The beam is inclined towards the lumps of clay. The lumps are therefore heavier than the *handi*.

*Teacher*—What am I to do then ?

*Pupil*—You have to remove a little of the clay.

*Teacher*—All right. What do you find now ?

*Pupil*—The clay and the *handi* weigh the same.

*Teacher*—Yes. How am I to weigh out a *poah* of water now ?

*Pupil*—You will have to put water into the *handi* and the *poah* counterpoise on the other pan.

*Teacher*—Very good. Let me do then what you say. Which way is the beam inclined ?

*Pupil*—It is inclined towards the counterpoise.

*Teacher*—What should be done then ?

*Pupil*—A little more water should be put into the *handi*.

*Teacher*—Good. What do you see now ?

*Pupil*—The weight of the water is exactly equal to the weight of the counterpoise.

*Teacher*—I will now pour the water out of the *handi* into this glass. Mark the surface of the water in the glass. I am



now going to cut out a notch inside the glass shewing the height to which water has risen within it.

*Teacher*—Let me now pour the water out of the glass into the *handi* back again. Let me now fill the glass with water up to the notch and pour this water also into the *handi*. How much water is within the *handi* now?

*Pupil*—Half a seer.

*Teacher*—Let me put into the *handi* two more glasses of water. How much water is in the *handi* now?

*Pupil*—One seer.

*Teacher*—Good. Let us call this glass a *poah* for measuring water. This means that the weight of the water which fills this glass up to the notch is a *poah*. Now tell me, my boys, how am I to measure two seers of water.

*Pupil*—Eight glasses will make two seers.

*Teacher*—Good. We can similarly prepare a *poah* for measuring milk, a *poah* for measuring oil, etc.

*Teacher*—The seller of milk or the seller of oil often uses short *poahs* to cheat people. Every household therefore should have a *milk-poah* and an *oil-poah* of its own to test the correctness of any measurement of such articles.

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## LESSON VII.

(On Time.)

*Teacher*—Well, my boys, do you know the name of the time from sunrise to sunset?

*Pupil*—Day-time.

*Teacher*—What is the name of the time from sunset to sunrise?

*Pupil*—Night.

*Teacher*—What do you call the time from one sunrise to the next ?

*Pupil*—A day.

*Teacher*—A day may be said to be divided into two parts. What are they ?

*Pupil*—Day time and night.

*Teacher*—Very good. What day of the week is today ?

*Pupil*—Wednesday.

*Teacher*—What day of the week was yesterday ?

*Pupil*—Tuesday.

*Teacher*—What day of week will be tomorrow ?

*Pupil*—Thursday.

*Teacher*—How many days make a week ? Will you name the days of the week beginning with Sunday ?

*Teacher*—How many months make a year ? Name the months.

*Pupil*—Baisakh, Jaistha, Asarh, Sraban, Bhadra, Aswin, Kartik, Agrahayana, Paush, Magh, Falgoon, Chaitra.

*Teacher*—Do you know how many days make a month ?

*Pupil*—Thirty days.

*Teacher*—Every month is not made of thirty days. Some months are made of twenty nine days, some of thirty one days and some even of thirty two days.

*Teacher*—Do you know how many weeks or how many days make a year ? Fiftytwo weeks and one day, or 365 days, make a year.

*Teacher*—What month is this ?

*Pupil*—It is the month of Baisakh.

*Teacher*—How many days of the month are over ?

*Pupil*—Three days.

*Teacher*—What day of the month is today ?

*Pupil*—The fourth day.



*Teacher*—What *season* is this! Is it the winter or the summer?

*Pupil*—It is the summer season.

*Teacher*—How does the summer differ from the winter?

*Pupil*—In the winter season we have to use warm clothing, water becomes very cold, dews fall on the grass and on the leaves of plants, the sunshine becomes feeble and the day-time becomes short. In the summer season the sunshine becomes strong, the day-time becomes long, no dews are seen, our bodies sweat and we want *punkhas* to cool ourselves.

*Teacher*—Very good.

[To give the children a clear idea of the nature of the different seasons, the teacher should hold a conversation with them on the subject once or twice every month.]

## LESSON VIII.

(On Time.)

**Apparatus :** A clock or a time-piece.

**Note.** This lesson should be taken up only after the children have been taught the use of a clock or time-piece and after they have learnt the table of *Araia* (আড়াইয়া)

*Teacher*—Look at the time-piece, my good chap, and tell me what time of the day it is.

*Pupil*—It is fifteen minutes past eight.

*Teacher*—Right. What time hence will it be nine?

*Teacher*—Fortyfive minutes hence.

*Teacher*—What time hence will it be “fifteen minutes past eight” again?

*Pupil*—Twelve hours hence.

*Teacher*—Good. You noted the time of sunrise this morning. Didn't you?

*Pupil*—Yes Sir, it was twenty six minutes past five.

*Teacher*—All right. We shall meet here again in the evening and note the time of sunset.

*Teacher*—(In the evening) The sun is going down slowly. He has just disappeared completely! Note the time, will you?

*Pupil*—It is twentysix minutes past six.

*Teacher*—What is the time from “twentysix minutes past five” in the morning to “twentysix minutes past six” in the evening?

*Pupil*—Thirteen hours.

*Teacher*—How do you find it?

*Pupil*—It is twelve hours from twentysix minutes past five in the morning to twentysix minutes past five in the evening. To this we have to add one hour. Hence the whole time is thirteen hours.

*Teacher*—Very good. The length of the day time then is thirteen hours. What will be the length of the night?

*Pupil*—Eleven hours.

*Teacher*—How?

*Pupil*—The whole day is twentyfour hours. We have therefore to subtract thirteen from twentyfour, and the result is eleven.

*Teacher*—Very good. You have learnt then now to find the lengths of the day-time and the night. Henceforth you must do this yourselves at home at least once a week.

*Teacher*—Read aloud with me:—

Twentyfour minutes make one *danda*, two and a half *dandas* make one hour, three hours make one *prahar*, eight *prahars* make a day.

*Teacher*—How many *dandas* is a *prahar* equal to?

*Pupil*—Seven and a half *dandas*.

*Teacher*—How?



*Pupil*—A *prahar* is equal to three hours and an hour is equal to two and a half *dandas*. Hence a *prahar* is equal to three times two and a half, or seven and a half *dandas*.

*Teacher*—Quite so. How many *dandas* make a day? and how?

*Pupil*—Twentyfour hours is equal to twentyfour times two and a half, or sixty, *dandas*. Hence sixty *dandas* make a day.

*Teacher*—Very good. I am going to tell you a new thing now. What time is called *Monday*, my boy?

*Pupil*—The time from *sunrise on Monday morning to sunrise on Tuesday morning*.

*Teacher*—Yes. But according to English calculation the time from twelve o'clock on Sunday night to twelve o'clock on Monday night is called *Monday*. What time then is called *Saturday* according to English calculation?

*Pupil*—The time from twelve o'clock Friday night to twelve o'clock Saturday night.

*Teacher*—What do Englishman call the time which the Indians call "two o'clock *Saturday night*"?

*Pupil*—Two o'clock *Sunday morning*.

*Teacher*—Quite so.

## LESSON IX.

(On *Pumpkin*.)

**Apparatus:** One green pumpkin, an ordinary balance with counterpoises, a knife, and some pumpkin seeds.

*Teacher*—(Putting the pumpkin before the children) What do you know of this, my boy?

*Pupil*—It is the fruit of a plant. It is called pumpkin. It is eaten with rice when cooked.

*Teacher*—What is its colour?

*Pupil*—Green.

*Teacher*—Describe its shape.

*Pupil*—It is longish, narrow towards the stalk and broad towards the other end.

*Teacher*—I will cut it *at right angles to its length* at the place where it begins to be broad. How does the inside look?

*Pupil*—It looks white.

*Teacher*—What is the form of the surface made by cutting?

*Pupil*—Round.

*Teacher*—Wherever it may be cut, if it is cut *at right angles to its length* the form of the surface made by cutting will be round like this. Now let me cut the larger piece *lengthwise* through its middle.

*Teacher*—(Putting the two halves with their curved surfaces in contact with the ground) Will you copy the forms of the tops of these two pieces on your slates?

*Teacher*—Hold this piece of the pumpkin in one hand and the one-seer counterpoise in the other. Which is the heavier of the two? The correctness of your answer shall be tested by the balance.

*Teacher*—(Putting the seeds before the children) What are these, my boys?

*Pupil*—Pumpkin seeds.

*Teacher*—Let us plant some of these seeds in our garden. You will have to water the seeds every day to make them grow. What matter of delight will it be to you when the sprouts come out. We shall rear the plants with care and afterwards get from them such fruits again! What a pleasure will it be to us all *then*!

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## LESSON X.

(On Brinjal.)

**Apparatus :** Brinjals of different shapes and colours, a knife, a green branch of the brinjal plant with leaves, an ordinary balance with counterpoises, a few lumps of dry clay, some light fuel and a match box.

*Teacher*—(Putting a brinjal before the class) What do you know of this, my boys ?

*Pupil*—It is the fruit of a plant. It is called *brinjal*. It is eaten with rice when cooked.

*Teacher*—What are these ?

*Pupil*—These also are brinjals.

*Teacher*—What are their colours ?

*Pupil*—This one is indigo, this one is greenish, this one is partly greenish and partly indigo.

*Teacher*—Describe the form of this one.

*Pupil*—It is straight, narrow, round at right angles to its length, and equally broad everywhere.

*Teacher*—What is the form of *this* one ?

*Pupil*—It is longish, round at right angles to its length, and gradually more and more broad from the stalk downwards.

*Teacher*—Very good. I take the last one and cut it *lengthwise* through its middle. Will you copy on your slates the form of either of the surfaces made by cutting ?

*Teacher*—I take the first one and cut it at right angles to its length. What is the form of either of the surfaces made by cutting ?

*Pupil*—Round.

*Teacher*—Will you pass your fingers lightly over the curved surfaces of the brinjals ? How do they feel ?

*Pupil*—Smooth.

*Teacher*—Do you know this thing ?

*Pupil*—It is a branch of the brinjal plant.

*Teacher*—Trace the outline of its leaf on your slates. Will you ?

*Teacher*—What is it that the brinjal leaf has, but a pumpkin leaf has not ?

*Pupil*—Thorns !

*Teacher*—(Taking a fresh brinjal) Let us weigh this brinjal. Its weight is found to be equal to that of this lump of clay. Let us now make fire and burn the brinjal.

*Teacher*—Let us weigh it again. I will put the burnt brinjal on one pan of the balance and that lump of clay on the other. What do you find ?

*Pupil*—The brinjal has become much lighter than before ?

*Teacher*—Quite so. The watery portion of the fruit has been driven away by heat ; so it has lost a part of its weight.

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## LESSON XI.

(On Beans.)

**Apparatus :** A number of beans, a knife, an ordinary balance with counterpoises.

*Teacher*—(Putting a bean before the children) Will you describe this little thing, my boys ?

*Pupil*—It is the fruit of a plant. It is called a *bean*. It is eaten with rice when cooked.

*Teacher*—What is its colour ?

*Pupil*—Green.

*Teacher*—Will you each take a bean and trace the outline of its shape on your slates ?

*Teacher*—Let me cut it open along this line. What are these ?

*Pupil*—Its seeds.



*Teacher*—Do you know the name of the covering within which the seeds lie?

*Pupil*—It is called the *pad*.

*Teacher*—Right. You must find out the plant of which these are the fruits; and bring me some of its leaves and ripe fruits this day next week.

*Teacher*—I will put the beans one by one on the palm of your right hand. As soon as you think that the weight of the leaves upon your hand is neither less than *a poah* nor greater than *a poah and a half*, you must say at once "Put no more please". The correctness of your answer shall then be tested by the balance.

## LESSON XII.

### (*On the Human Body.*)

*Teacher*—What is the covering of our bodies called, my little boys?

*Pupil*—The *skin*.

*Teacher*—What are these on the skin?

*Pupil*—The *pores*.

*Teacher*—Yes. It is through these pores that *sweat* comes out when we take any kind of bodily exercise.

*Teacher*—If you cut your finger with a knife, what happens?

*Pupil*—*Blood* comes out.

*Teacher*—What is the colour of blood?

*Pupil*—Red.

*Teacher*—(Shewing some of the veins) What do these look like?

*Pupil*—They look like blue threads.

*Teacher*—These are the *veins* of the body. There are a great number of them, and it is through them that the blood passes and repasses from one part of the body to another.

*Teacher*—Now tell me, my boys, what are the chief things that our body is made of.

*Pupil*—The bone, the flesh, the blood and the skin.

*Teacher*—Gopal, will you come to me? Look here, my boys. This is the *skull* of Gopal's head. Will you all shew your skulls now?

*Teacher*—All right. The forehead, the ears and the hair are all placed on the skull. Inside the skull there is a soft whitish substance like *ghae*, which is called the *Brain*; and it is the brain that is taken to be the "store-house" of intelligence.

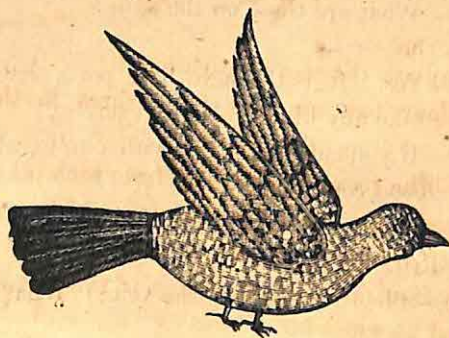
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### LESSON XIII.

( *On a Pigeon* )

**Apparatus :** Some feathers of a pigeon ; and a live pigeon , if possible.

*Teacher*—What does this picture look like ?



*Pupil*—It looks like the picture of a pigeon.

*Teacher*—What does it seem to be doing ?

*Pupil*—It is flying.



*Teacher*—Name the parts of its body that I successively point out.

*Pupil*—The head, the bill, the eyes, the neck, the legs, the toes, the wings, the tail.

*Teacher*—How does the head look?

*Pupil*—It is small, round, and gradually more and more narrow towards the bill.

*Teacher*—What is the difference between the head of a bird and the head of a cow?

*Pupil*—The cow has a nose and two ears; but we don't see the nose and ears of a bird. Birds have bills which the cow has not. The cow has horns which a bird has not.

*Teacher*—Very good, my young lad. How many are the feet of the pigeon?

*Pupil*—Two feet.

*Teacher*—Look at a picture of its feet.



How many are the toes on each foot?

*Pupil*—Four toes on each foot, three in the front and one behind.

*Teacher*—The toes also are apart from each other and not closely placed like ours. Henceforth whichever bird you come to meet, you must carefully observe its toes.

*Teacher*—How many are the wings of the pigeon? What if the birds had no wings?

*Pupil*—They could not fly.

*Teacher*—(Putting a feather before the children) What is this, my boy?

*Pupil*—A feather.

*Teacher*—Look at the live pigeon before you. Its body is full of feathers ! How beautifully are the feathers placed on its wing and tail !

*Teacher*—Do you know what the pigeon feeds on ?

*Pupil*—It feeds on small worms and insects and also on grain.

*Teacher*—How does the pigeon use its bill ?

*Pupil*—The pigeon uses the bill in catching its food and also in gathering bits of straw and grass to make its nest.

*Teacher*—Good. Birds have no teeth, my little fellows. They don't chew their food as we do. Whatever they have to eat they swallow at once. The pigeon had got something like a bag in its throat, which serves as a store-house for food for its young ones.

*Teacher*—Have you heard the cry of a pigeon, my good chaps ? How is that ?

*Pupil*—*Bag-ba-goom, bag-ba-goom, bag-ba-goom !*

*Teacher*—Very good Will you hear something about the pigeon's keen sight and wonderful instincts ? If you take a pigeon to a great distance from its nest and let it go, do you know what it does ? It flies off at once in any direction that suits it best and when it feels that it is quite out of the hands of its catcher, it begins to fly in circles gradually making a larger and larger sweep as it rises higher and higher. It thus surveys things on all sides and as soon as it catches sight of any striking object with which it is already familiar it shapes its course in that direction. This way the pigeon finds its way back to its nest. Just fancy the doings of a pigeon ! How wonderful they must be !

*Teacher*—I will tell you another story about pigeons. Have any of you heard of the *Carrier Pigeon* ? It does the work of a messenger ! Suppose you go to a distant place from



home and want to let your *Pappa* and *Mamma* know at once of your safe arrival there. Take then a tame pigeon of this kind with you, tie a letter to its feet after arrival at the place and let it go. It will soon find its way back to your house where it has its nest, and your parents will be very *very* glad to receive your letter !

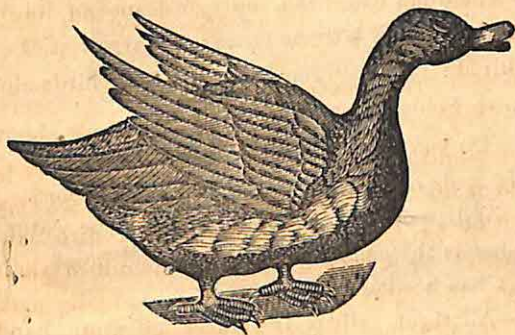
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## LESSON XIV.

(On a Duck.)

**Apparatus :** A *malsha* of water and a little mustard oil.

*Teacher*—What is this the picture of, my good lads ?



*Pupil*—A Duck.

*Teacher*—Name the parts of its body as I point them out.

*Pupil*—The head, the bill, the eyes, the neck, the legs, the feet, the wings, the tail.

*Teacher*—How does the bill look ?

*Pupil*—It is flat and broad.

*Teacher*—How is the neck ?

*Teacher*—The neck is longish and curved.

*Teacher*—Are the legs short or long ?

*Pupil*—Short.

*Teacher*—Look at its feet. Had does a duck's foot differ from a pigeon's foot ?

*Pupil*—The toes in the duck's feet are *webbed*.

*Teacher*—Quite so. How is the tail ?

*Pupil*—Very short.

*Teacher*—You must have seen live ducks. Can the ducks fly ?

*Pupil*—They can fly only a little.

*Teacher*—The pigeon cannot, but the duck can. What is it ?

*Pupil*—To swim.

*Teacher*—Yes. How beautiful do the ducks appear when they swim ! The duck can swim, only because of its webbed feet. You cannot row a boat by means of narrow sticks, broad oars are required ; for a similar reason those birds alone can swim that have webbed feet.

*Teacher*—Do you know what the duck feeds on ?

*Pupil*—It feeds on worms, insects and small fishes.

*Teacher*—Will you dip your hand into the water in the *malsha* ? What is the condition of your hand now ?

*Pupil*—It has become wet.

*Teacher*—All right. Rub the water off your hand, and then rub the back of it with oil. Will you dip the hand into the water again ?

*Pupil*—There is no water on the back of the hand now ?

*Teacher*—The duck swims in water and yet its body does not become wet. What does this shew ?

*Pupil*—The body of the duck is oily.

*Teacher*—In what way are the bodies of a pigeon and duck alike ?



*Pupil*—Both are covered with feathers.

*Teacher*—Very good. The duck is really an interesting animal and you should all try to know more of it. Have you heard the cry of a duck? What is it like?

*Pupil*—Pank, pank, pank, pank.

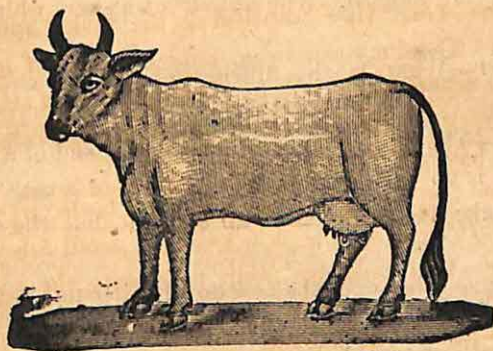
*Teacher*—Yes. Will you now write on your slates "pank, pank, pank"?

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## LESSON XV.

(On a Cow.)

*Teacher*—What is this the picture of?



*Pupil*—It is the picture of a cow.

*Teacher*—Name the parts of its body as I point them out to you.

*Pupil*—The head, the horns, the eyes, the ears, the nose, the neck, the back, the belly, the udder, the tail, the legs, the feet.

*Teacher*—Which of the animals that you have seen have horns?

*Pupil*—The goat, the sheep, the buffallow.

*Teacher*—How many legs has the cow ?

*Pupil*—Four legs.

*Teacher*—Name other animals having four legs.

*Pupil*—The cat, the dog, the jackal, the horse, the elephant, the goat, the sheep, the buffallow, the mouse, the rat, the mole.

*Teacher*—How do the front legs of a cow differ from the hind legs ?

*Pupil*—The front legs are straight, the hind legs are curved.

*Teacher*—How does a cow's head differ from a cat's ?

*Pupil*—There are horns on the head of a cow but no horns on the head of a cat. The head of a cat is round, the head of a cow is longish. The cat has whiskers which the cow has not.

*Teacher*—What is the difference between a cow's tail and a cat's ?

*Pupil*—There is a bunch of hair at the end of a cow's tail but there is no such thing at the end of a cat's tail. The cat can make its tail stand up straight, but the cow cannot do so.

*Teacher*—What does the cow do with her tail ?

*Pupil*—With the tail the cow drives away flies and mosquitoes that trouble her.

*Teacher*—Look at the cow's feet.

*Pupil*—Each foot is divided into two parts.

*Teacher*—So it is. Do you know the name of the horny substance that forms each foot of a cow ?

*Pupil*—It is called the *hoof*.

*Teacher*—Good. How does the foot of a cat differ from the foot of a cow ?

*Pupil*—The foot of a cow is made of a *hoof* divided into two parts, the foot of a cat is not so. The foot of a cat has



toes and claws which the foot of a cow has not. The bottom of a cat's foot is soft, but that of the cow's feet is hard.

*Teacher*—How many rows of teeth have we ?

*Pupil*—We have two rows of teeth.

*Teacher*—The cow has only *one* row of teeth ! She has got no teeth in the upper jaw. The upper jaw however is very hard.

*Teacher*—The cow does not chew her food as we do. She swallows at once what she has to eat. The thing swallowed are at first stored in a bag within her belly. When the cow lies down to rest she brings up the store into the mouth in successive lumps. As soon as a lump is chewed completely she swallows it back again, and brings up another instead. The cow is said to “chew the cud” when she does so.

*Teacher*—Of what use is the cow to us ?

*Pupils*—The cow gives us milk.

*Teacher*—What things are obtained from milk, my little chap ?

*Pupil*—Cream, curd, butter and *ghee*.

*Teacher*—Yes. And these things when eaten give us strength. You see then how many good things we get from the cow ! You should therefore all love the cow and treat her well.

---

## LESSON XVI.

(*On Vessels.*)

**Apparatus :** An earthen *kalshi*, a brass *lotah*, a glass bottle, some small lumps of clay, and a knife.

*Teacher*—What are the three things that I have placed before you, my good boys ?

*Pupil*—A *kalshi*, a *lotah* and a bottle.

*Teacher*—What are they respectively made of ?

*Pupil*—The *kalshi* is made of clay, the *lotah* is made of brass, and the bottle is made of glass.

*Teacher*—What single word is that which means either a *kalshi* or a *lotah*, or a bottle, or any other thing of this kind ?

*Pupil*—Vessel.

*Teacher*—Good. What are the colours of these three vessels ?

*Pupil*—The *kalshi* is red (or black), the *lotah* is yellowish and the bottle is whitish (or greenish.)

*Teacher*—Will you compare the bottoms of the vessels ?

*Pupil*—The bottom of the *kalshi* is like a part of the surface of a ball. The bottom of the *lotah* is flat and round. The bottom of the bottle is round like a ring ; it has a hollow in the middle.

*Teacher*—Shut up your eyes, my boys. (Silently putting a lump of clay into each of the vessels) Open your eyes now. Do you see anything in any of these vessels ?

*Pupil*—We don't see whether there is any thing either in the *kalshi* or in the *lotah*. But we see very clearly that there is a lump of clay within the bottle.

*Teacher*—Very true. Look here, the *kalshi* and the *lotah* each contains a lump ! We can see through glass but we cannot see through brass or clay. Do you know what are those things called that can be seen through ? Such things are said to be *transparent*. What other transparent thing do you know of ?

*Pupil*—Water.

*Teacher*—Take this knife and scratch each of the vessels, will you ?

*Pupil*—It is easy to make a scratch on the *kalshi*, but not so easy to scratch the *lotah*. No scratch is made on the bottle at all ?



*Teacher*—What does it show, my boy ?

*Pupil*—The *lotah* is harder than the *kalshi* and the bottle is harder than the *lotah*.

*Teacher*—Very good.

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## LESSON XVII.

(*On common Metals.*)

**Apparatus :** A rupee, an eight-anna piece, a four-anna piece, a two-anna piece, a pice, a half pice, a pair of brass scales, a small tin box, a nail, a screw, a knife, a key.

*Teacher*—Well, my boys, you see a large collection of things before you. I will hold up the things before you one by one. Name the thing I hold up and tell me what it is made of.

*Teacher*—Very good. What is the common name for gold, silver, copper, iron and things of that kind ?

*Pupil*—*Metal*.

*Teacher*—Do you know where the metals come from ? You will be surprised to know that they are dug out of the ground !

*Teacher*—Name the things made of iron that you know of and tell me their uses.

*Teacher*—Very good. The things made of iron are most useful to us then !

*Teacher*—Of what use is gold to us ?

*Teacher*—Yes. Which of these two metals then is the one that we cannot do without.

*Pupil*—Iron.

*Teacher*—Quite so, my boy. Will you now take the scales and shew that a rupee weighs twice as much as an eight-anna piece, an eight-anna piece weighs twice as much as a four-anna

piece, and a four-anna piece weighs twice as much as a two-anna piece ?

*Teacher*—How many pice will an eight-anna piece give you ? Of copper and silver, which is the more valuable then ?

*Teacher*—What is the common name for rupees, pice and things of that kind ?

*Pupil*—Coins.

*Teacher*—Now tell me, my boy, what you have learnt about the metals today.

*Pupil*—Gold, silver, copper, iron, etc., are known as metals. Metals are dug out of the ground. Of the several metals, it is the iron that is most useful to us. Of copper and silver, the silver is the more valuable. Rupees, eight-anna pieces, pice, etc., are called coins.

*Teacher*—Very good. Will you now write out on your slates what you have said ?

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## LESSON XVIII.

*(On Plants yielding Fibres.)*

**Apparatus :** A flax plant, a hemp plant, a few coverings of the plaintain tree, a pine apple leaf, the rind of a cocoanut, a small string made of sunn and one of the same size made of jute, a *dao* and a knife.

*Teacher*—Will you try the strength of each of these two strings, my cheerful lads ? Which is the stronger of the two ?

*Teacher*—I will untwist the strings now and shew you the fibres of which each is made of.

*Teacher*—These fibres which made up the stronger string came from the bark of the sunn plant. The fibres of the sunn plant are therefore stronger than those of the jute. Fishermen use sunn fibres in preparing nets for catching fish.



*Teacher*—Look here, my boys. This is a *flax plant*, of which the seed is known by the name of linseed. These are a few *coverings of the plantain tree*. This is a *pine apple leaf*. This is a *hemp plant*. And here you have the *rind of cocoanut*.

*Teacher*—Each of these things yields fibres, which I am now going to prove to you.

*Teacher*—You see then that they all yield fibres. The flax and hemp fibres are highly valued, as they are used in making cloths like linen, cambric, etc. The plantain and pine apple fibres give strong ropes and strings; they may also be used in making cloth.

*Teacher*—The rind of cocoanuts is useful in many ways. The fibres make very strong ropes. When cut at right angles to its length the rind serves as a good brush for cleaning household furniture. The cocoanut fibres are also used in stuffing cushions.

*Teacher*—What then are the plants, my boys, that you may have known to yield fibres?

*Pupil*—The sunn, the jute, the flax, the hemp, the plantain, the pine apple and the cocoanut.

*Teacher*—Look at your *dhuties* and *chadars*, my dear boys. What are they made of?

*Pupil*—They are made of threads.

*Teacher*—Do you know where do these threads come from?

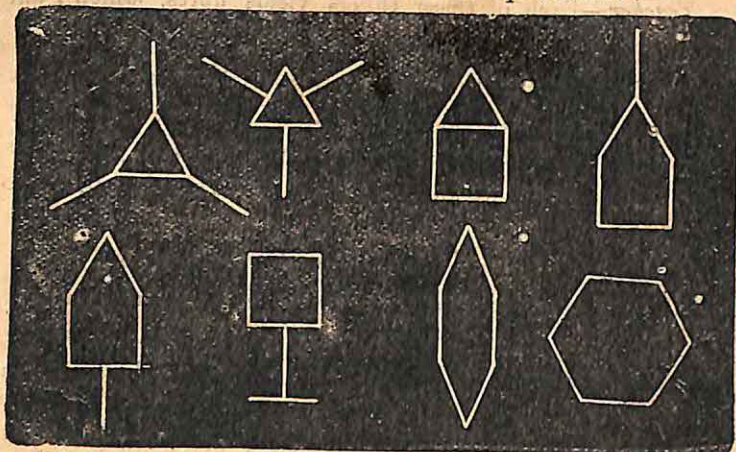
*Pupil*—The threads are made from *cotton*.

*Teacher*—And where does cotton come from? It comes from the *fruits* of a certain plant! This plant is known by the name of *cotton plant*.

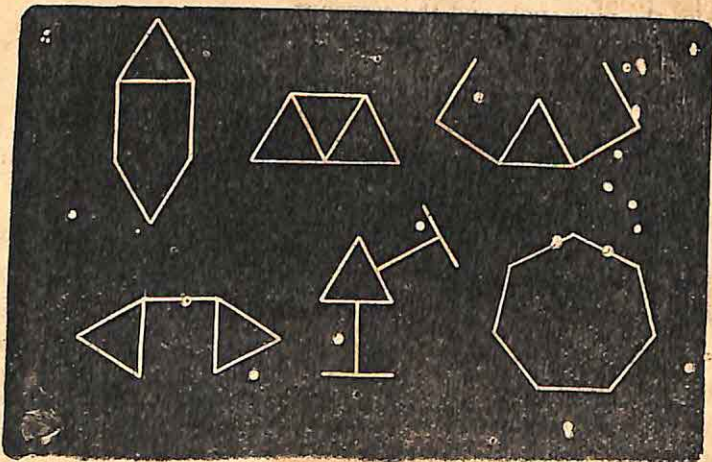
*Teacher*—Do you know where the fibres of which a shawl or a blanket is made, come from? You will be simply surprised to hear of it. These fibres are nothing but the *hair* of a certain kind of sheep!

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## LESSON XIX.

*(On Stick laying.)***Apparatus :** Bundles of sticks.*Teacher*—Look here, my boys. These are some of the figures that may be constructed with six equal sticks :—

Will you make copies of these figures with your sticks?

*Teacher*—The following are some of the figures that may be constructed with *seven* equal sticks :—

Will you make copies of them with your sticks?



**Note.** The children may thus be gradually taught to construct forms with 8, 9, or 10 sticks. They should be encouraged to exercise their own imagination and originality in inventing forms for themselves.

## LESSON XX.

( *On Seed work.* )

**Apparatus:** A number of sticks each three inches long and pointed at both ends; and a number of berries (known as *booj* in parts of Bengal).

*Teacher*—You are all familiar with these fruits. Are n't you, my little friends?

*Teacher*—Look at the sticks. Are they similar to those that you used before?

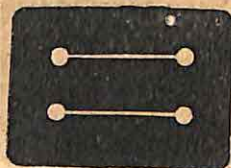
*Pupil*—No Sir. They are pointed at both ends!

*Teacher*—Yes. I am going to introduce to you a new kind of play today.

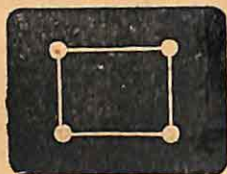
*Teacher*—Look here. I take one of the sticks and two of the fruits. See what a nice little figure has been made!



*Teacher*—I take another stick and two other fruits. We have two figures now!

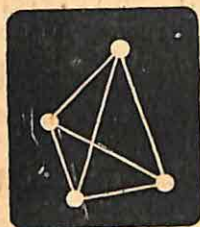


*Teacher*—I take two more sticks and see how I join the two figures into one !

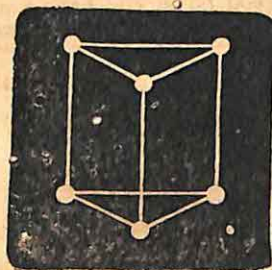


*Teacher*—I will now give a number of sticks to every one of you. Will you do as I have done ?

**Note.** Six sticks and four berries will give a figure of this kind :—

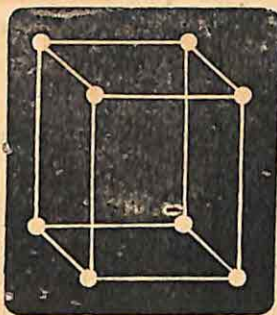


Nine sticks and six berries will give a figure like the following :—





Twelve sticks and eight berries will give a figure like the following :—



The teacher should first shew the children how to construct a figure and then ask them to do it independently. One figure only should be taken up at a time, and no new figure should be presented before the pupils until they have learnt to take pleasure in constructing the old.

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## LESSON XXI.

(*On Drawing.*)

**Apparatus :** Bundles of sticks ; leaves of various plants.

*Teacher*—My good boys, you have now learnt to construct figures of various shapes with six, seven and even eight sticks. Will you first construct a figure with sticks and then make a copy of it on your slates ? Shew me the copy as soon as it is made.

**Note.** After the children have had a sufficient number of exercises in drawings of this kind, they may be directed to draw geometrical figures of various shapes ;—

1. Draw an equilateral triangle with a square on each of its sides.

2. Draw a square with equilateral triangles on its sides.

3. Draw an oblong with equilateral triangles on its sides.

4. Draw an oblong with squares on its sides.

And so on.

*Teacher*—My good lads, you have already learnt to trace outline of various kinds of leaves. Will you now trace on your slates, from memory, the outline of a Banyan leaf?

*Teacher*—(After the children have done so) Do you see what I have got in this basket? I have got here leaves of various plants. Here is a Banyan leaf. I will now compare your drawings with this leaf and test their correctness.

**Note.** A similar method is to be followed successively with each of the other leaves.

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## LESSON XXII.

(On Writing.)

**Note.** This lesson should be taken up much earlier than most of the preceding ones.

*Teacher*—Jadu, will you write “ज” on the board? The “ज” does not look well. Ram, will you write one? This “ज” is all right.

*Teacher*—Kedar, will you come and write “ख”? Haren, will you come and write “क”? Jiten, will you come and write “ग”? etc.

[Every time that a letter is written the teacher should point out its defects if any, and in that case ask the pupil to write it again. After the children have learnt to join vowels



with consonants, they should be taught to write simple words. They should be next taught to write short sentences in the following manner.]

*Teacher*—Ram, will you come to the board and write “*আমি বাবার নিকট চিঠি লিখিয়াছি*”?

*Teacher*—Your writing is not clear, my friend. It reads “*আমিবা—বারনি—কটচিঠিনি—খিয়াছি*”!

*Teacher*—Kedar, let us see how *you* would do it.

*Teacher*—Kedar's writing is not faulty like Ram's; the head of one word has not been joined with the tail of another. There is sufficient space between every two words. But I notice another kind of defect in it. Gopal, can you say in what way Kedar's writing has become faulty?

*Gopal*—The letters are not all of the same size. Some of them are too small and some too large.

*Teacher*—Exactly. Let us now see how *Gopal* would write out the sentence. Will you write it out just below Kedar's writing?

*Teacher*—Gopal's writing has not the faults noticed in Ram's or Kedar's. It is faulty in quite another way. The *৳* has lost its loop, and it looks like a *৳*; the *৳* looks like *৳*? I will write out the sentence myself now. Will you now all write it on your slates as I have done on the board?

**Note.** After the children have learnt to write out short sentences containing simple words in the manner shewn above, they should be taught to join consonants with consonants just in the same way as they were taught to join vowels with consonants.

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## LESSON XXIII.

*(On Notation up to 1000.)*

*Teacher*—You all know how to write one hundred, my beloved lads. Will you now write on your slates two hundred ? seven hundred ? nine hundred ?

*Teacher*—Will you now write ten hundred ?

*Pupil*—There it is

1000.

*Teacher*—Very good. To write seven hundred you have to put two zeros after 7. To write ten hundred therefore you have to put two zeros after 10.

*Teacher*—"Ten hundred" has got another name. It is called *one thousand*.

*Teacher*—Read what I have written on the board :—

101.

*Pupil*—One hundred one.

*Teacher*—Quite so. Will you now write on your slates *one hundred two ? one hundred five ? one hundred nine ? two hundred one ? eight hundred seven ?* etc.

*Teacher*—Read what I have written on the board :—

110.

*Pupil*—One hundred ten.

*Teacher*—Very good. Will you now write on your slates *one hundred fifty ? two hundred eighty ? three hundred forty ?* etc.

*Teacher*—Read what I have written on the board :—

125, 238, 675.

*Pupil*—One hundred twentyfive, two hundred, thirtyeight, six hundred seventyfive.



*Teacher*—Very good. Will you now write on your slates *one hundred fiftyfive? three hundred sixtytwo? nine hundred ninety-nine?*

*Teacher*—What is *nine hundred ninety-nine* and *one*.

*Pupil*—Ten hundred or *one thousand*.

*Teacher*—How is *one thousand* written?

*Pupil*—It is written with three zeros after *one*.

*Teacher*—Very good.

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## LESSON XXIV.

*(On Notation up to 10,000.)*

*Teacher*—My good lads, will you write *two thousand? five thousand? eight thousand? ten thousand?*

*Teacher*—Yes. To write *eight thousand* you have to put three zeros after 8. Hence to write *ten thousand* you have to put three zeros after 10.

*Teacher*—Read what I have written on the board:—

**1001, 5008.**

*Pupil*—One thousand one, five thousand eight.

*Teacher*—Will you now all write on your states *one thousand nine? three thousand five? etc.*

*Teacher*—What have I written on the board?

**1010, 3050.**

*Pupil*—One thousand ten, three thousand fifty.

*Teacher*—Very good. Will you now write on your slates *three thousand ten? four thousand eighty? nine thousand ninety? etc.*

*Teacher*—What have I written on the board?

**1062, 5023.**

*Pupil*—One thousand sixtytwo, five thousand twenty three.

*Teacher*—Will you now all write on your slates *one thousand twentyfive? seven thousand thirtytwo? etc.*

*Teacher*—What have I written on the board?

**1520, 4356.**

*Pupil*—One thousand five hundred twenty, four thousand three hundred fifty six.

*Teacher*—Will you now all write on your slates *one thousand three hundred sixteen? five thousand four hundred seventy? etc.*

*Teacher*—How many figures are required to write *any* number from one hundred to nine hundred ninety nine?

*Pupil*—Three figures.

*Teacher*—How many figures are required to write *any* number from one thousand to nine thousand nine hundred ninety nine?

*Pupil*—Four figures.

*Teacher*—How many figures are required to write *ten thousand?*

*Pupil*—Five figures.

*Teacher*—What are those figures?

*Pupil*—One and four zeros.

*Teacher*—Very good.

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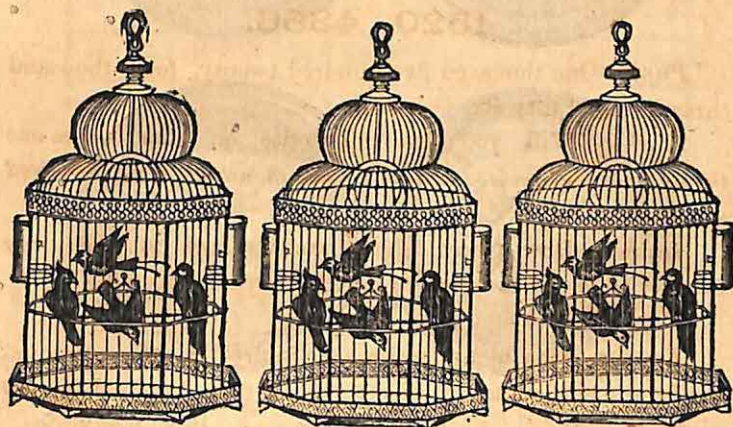


## LESSON XXV.

(On Multiplication.)

**Apparatus:** A number of tamarind seeds.

**Teacher**—What do you find in this picture, my boys?



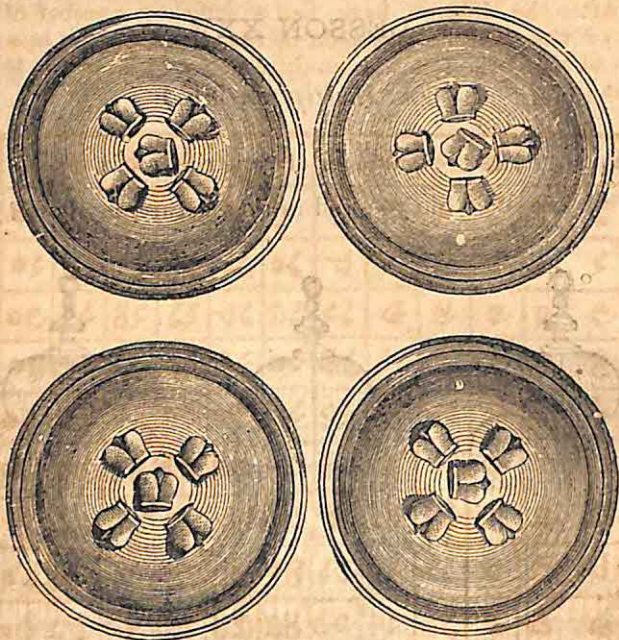
**Pupil**—Cages with birds in them.

**Teacher**—How many cages? How many birds in each cage?  
Will you count the total number of the birds?

**Pupil**—One, two, three, four, five, six, seven, eight, nine,  
ten, eleven, twelve. *Twelve* in all.

**Teacher**—You see then that *four* and *four* and *four*—*three*  
*fours*—make twelve.

**Teacher**—Will you now look at this picture? You have  
got here some of your most beloved things—*Sandeshas*!



*Teacher*—How many *thalas* do you see? How many *Sandeshas* on each *thala*? How many *Sandeshas* in all?

*Pupil*—Twenty in all.

*Teacher*—You see then that *five* and *five* and *five* and *five*—four fives—make twenty.

*Teacher*—Will you put *five* groups of tamarind seeds on the table, each group containing *three* seeds? Will you count the total number of *seeds* in these groups?

*Pupil*—Fifteen seeds in all.

*Teacher*—What does this shew?

*Pupil*—Five threes are fifteen.

*Teacher*—Good. Will you now put five groups of seeds on the table, each group containing *seven* seeds? How many seeds are there in all?

*Pupil*—Thirtyfive seeds.

*Teacher*—What does it shew?

*Pupil*—Five sevens are thirtyfive.

*Teacher*—Very good.



[ After the children have had a sufficient number of exercises of this kind, they should be made to stand up in a line and read aloud the following multiplication table in the following manner :—

	၁	၂	၃	၄	၅	၆	၇	၈	၉	၁၀
၁	၁	၂	၃	၄	၅	၆	၇	၈	၉	၁၀
၂	၂	၄	၆	၈	၁၀	၁၂	၁၄	၁၆	၁၈	၂၀
၃	၃	၆	၉	၁၂	၁၅	၁၈	၂၁	၂၄	၂၇	၃၀
၄	၄	၈	၁၂	၁၆	၂၀	၂၄	၂၈	၃၂	၃၆	၄၀
၅	၅	၁၀	၁၅	၂၀	၂၅	၃၀	၃၅	၄၀	၄၅	၅၀
၆	၆	၁၂	၁၈	၂၄	၃၀	၃၆	၄၂	၄၈	၅၄	၆၀
၇	၇	၁၄	၂၁	၂၈	၃၅	၄၂	၄၉	၅၆	၆၃	၇၀
၈	၈	၁၆	၂၄	၃၂	၄၀	၄၈	၅၆	၆၄	၇၂	၈၀
၉	၉	၁၈	၂၇	၃၆	၄၅	၅၄	၆၃	၇၂	၈၁	၉၀
၁၀	၁၀	၂၀	၃၀	၄၀	၅၀	၆၀	၇၀	၈၀	၉၀	၁၀၀

One one is one, one two is two, etc. Two ones are two, two twos are four, etc. Three ones are three, three twos are six, etc.

And so on.

The children should be made to recite this table from day to day until they get it thoroughly by heart. ]

## LESSON XXVI.

(On the idea of Fractional Numbers.)

**Apparatus:** A number of green plantains, and a knife.

**Teacher**—Look here, my boys. I am going to divide this plantain into two equal parts.

**Teacher**—(Holding up one part) What have I in my hand?

*Pupil*—Half of the plantain.

*Teacher*—I will now divide this half into two equal parts.  
(Holding up one of these parts) What part of the plantain have I in my hand now?

*Pupil*—A fourth part of it.

*Teacher*—How many fourths has a plantain got?

*Pupil*—Four fourths.

*Teacher*—(Putting two fourths before the children) What part of the plantain do you now see before you?

*Pupil*—Half of it.

*Teacher*—Very good. You see then that two fourths make a half.

*Teacher*—(Putting a half and a fourth before the children) What part of the plantain do you see before you now?

*Pupil*—Three fourths.

*Teacher*—Very good. (Putting one entire plantain and a quarter of another before the children) How many plantains do you see before you now?

*Pupil*—One plantain and a fourth.

*Teacher*—How many fourths are there?

*Pupil*—Five fourths.

*Teacher*—You see then that five fourths are the same as one and a fourth.

*Teacher*—(Putting one entire plantain and a half of another before the children) How many plantains do you see before you?

*Pupil*—One plantain and a half.

*Teacher*—How many fourths are there?

*Pupil*—Six fourths.

*Teacher*—Good. You see then that six fourths are the same as one and a half.

[After the children have had a sufficient number of such exercises they should be made to stand up in a line



and read aloud the following table of *fourths* in the following manner :—

	১	২	৩	৪	৫	৬	৭	৮	৯	১০
সিকিৎসা	১	২	৩	৪	৫	৬	৭	৮	৯	১০
	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০
সিকিৎসা	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮	২৯	৩০
	৩১	৩২	৩৩	৩৪	৩৫	৩৬	৩৭	৩৮	৩৯	৪০
সিকিৎসা	৪১	৪২	৪৩	৪৪	৪৫	৪৬	৪৭	৪৮	৪৯	৫০
	৫১	৫২	৫৩	৫৪	৫৫	৫৬	৫৭	৫৮	৫৯	৬০
সিকিৎসা	৬১	৬২	৬৩	৬৪	৬৫	৬৬	৬৭	৬৮	৬৯	৭০
	৭১	৭২	৭৩	৭৪	৭৫	৭৬	৭৭	৭৮	৭৯	৮০
সিকিৎসা	৮১	৮২	৮৩	৮৪	৮৫	৮৬	৮৭	৮৮	৮৯	৯০
	৯১	৯২	৯৩	৯৪	৯৫	৯৬	৯৭	৯৮	৯৯	১০০
সিকিৎসা	১০১	১০২	১০৩	১০৪	১০৫	১০৬	১০৭	১০৮	১০৯	১১০

One fourth is a *fourth*, two fourths are a *half*, three fourths are *three-fourths* (চোতন এক), four fourths are *one*, five fourths are *one and a fourth* (পাঁচন এক), six fourths are *one and a half*, seven fourths are *one and three fourths* (সাতন দুই), etc.

[The children should continue to recite this table from day to day until they have thoroughly got it by heart.]

## LESSON XXVII.

(On the idea of Fractional Numbers.)

**Apparatus:** A number of green plantains, and a knife.

*Teacher*—How many plantains have I placed before you, my dear boys?

*Pupil*—Four plantains and a half.

*Teacher*—I want to divide this group into three equal parts. Just see what I do. How many form each part?

*Pupil*—One and a half.

*Teacher*—Yes. You see then that *three* “one and a half”s make *four and a half*.

*Teacher*—I will shew you now how *four* “one and a half”s make *six*.

*Teacher*—Will you shew me now how *eight* “one and a half”s make *twelve*?

*Teacher*—How many plantains do you see on the table now?

*Pupil*—Seven plantains and a half.

*Teacher*—I am going to divide this group into three equal parts. How many plantains form each part?

*Pupil*—Two and a half.

*Teacher*—Yes. You see then that *three* “two and a half”s make *seven and a half*.

*Teacher*—I am now going to shew you how *four* “two and a half”s make *ten*.



*Teacher*—Will you shew me now how *six* “two and a half”s make *fifteen*?

*Teacher*—How many plantains do you see before you now?

*Pupil*—Two and a half.

*Teacher*—Just see how I divide this group into two equal parts. How many form each part?

*Pupil*—One and a fourth.

*Teacher*—Yes. You see then that *two* “One and a fourth”s make *two and a half*.

*Teacher*—I am now going to shew you how *three* “one and a fourth”s make *three and three-fourths*.

*Teacher*—Will you shew me now how *four* “one and a fourth”s make *five*?

**Note.** The following are the tables of multiples of “one and a half”s, “two and a half”s, and “one and a fourth”s (দেড়ি, আড়াই, and একতৃতীয়া) respectively. The children should be made to learn these tables just in the same way that they have learnt the preceding ones.

(1) TABLE OF MULTIPLES OF “ONE AND A HALF”S.

	১	২	৩	৪	৫	৬	৭	৮	৯	১০
১৥ এ	১৥ ৩	৪৥ ৬	৫৥ ৯	৬৥ ১২	৭৥ ১৫	৮৥ ১৮	৯৥ ২১	১০৥ ২৪	১১৥ ২৭	১২৥ ৩০
	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০
১৥ এ	১১৥ ১৮	১২৥ ২১	১৩৥ ২৪	১৪৥ ২৭	১৫৥ ৩০	১৬৥ ৩৩	১৭৥ ৩৬	১৮৥ ৩৯	১৯৥ ৪২	২০৥ ৪৫
	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮	২৯	৩০
১৥ এ	৩১৥ ৩৩	৩২৥ ৩৬	৩৩৥ ৩৯	৩৪৥ ৪২	৩৫৥ ৪৫	৩৬৥ ৪৮	৩৭৥ ৫১	৩৮৥ ৫৪	৩৯৥ ৫৭	৪০৥ ৬০
	৩১	৩২	৩৩	৩৪	৩৫	৩৬	৩৭	৩৮	৩৯	৪০
১৥ এ	৪১৥ ৪৮	৪২৥ ৫১	৪৩৥ ৫৪	৪৪৥ ৫৭	৪৫৥ ৬০	৪৬৥ ৬৩	৪৭৥ ৬৬	৪৮৥ ৬৯	৪৯৥ ৭২	৫০৥ ৭৫

## (2) TABLE OF MULTIPLES OF "TWO AND A HALF'S."

	১	২	৩	৪	৫	৬	৭	৮	৯	১০
২½ এ	২½	৫	৭½	১০	১২½	১৫	১৭½	২০	২২½	২৫
	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০
২½ এ	২৭½	৩০	৩২½	৩৫	৩৭½	৪০	৪২½	৪৫	৪৭½	৫০
	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮	২৯	৩০
২½ এ	৫২½	৫৫	৫৭½	৬০	৬২½	৬৫	৬৭½	৭০	৭২½	৭৫
	৩১	৩২	৩৩	৩৪	৩৫	৩৬	৩৭	৩৮	৩৯	৪০
২½ এ	৭৭½	৮০	৮২½	৮৫	৮৭½	৯০	৯২½	৯৫	৯৭½	১০০

## (3) TABLE OF MULTIPLES OF "ONE AND A FOURTH'S."

	১	২	৩	৪	৫	৬	৭	৮	৯	১০
১¼ এ	১¼	২½	৩¾	৫	৬¼	৭½	৮¾	১০	১১¼	১২½
	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০
১¼ এ	১৩¾	১৫	১৬¾	১৭½	১৮¾	২০	২১¾	২২½	২৩¾	২৫
	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮	২৯	৩০
১¼ এ	২৬¾	২৭½	২৮¾	৩০	৩১¾	৩২½	৩৩¾	৩৫	৩৬¾	৩৭½
	৩১	৩২	৩৩	৩৪	৩৫	৩৬	৩৭	৩৮	৩৯	৪০
১¼ এ	৩৮¾	৪০	৪১¾	৪২½	৪৩¾	৪৫	৪৬¾	৪৭½	৪৮¾	৫০



## CHAPTER VIII.

*Object-lessons, Writing and Arithmetic—Standard I.*

### LESSON I.

*(On the Sky.)*

**Apparatus:** A piece of rectangular glass, a small earthen lamp provided with oil and wicks, a lamp stand, and a match box.

*Teacher*—What marked difference is there between day-time and night, my dear boys?

*Pupil*—We see the sun during the day-time, but not during the night.

*Teacher*—Where is the sun to be seen?

*Pupil*—In the sky.

*Teacher*—What do you see in the sky during the night?

*Pupil*—The moon and the stars.

*Teacher*—Do you see the moon every night?

*Teacher*—How many are the stars? Can you count their number?

*Pupil*—No Sir.

*Teacher*—So we say the stars are *countless* or *innumerable*.

*Teacher*—The sun gives out very strong light which dazzles our eyes when we look at the sun. Hence we cannot see the sun well. I am going to make a contrivance however which will enable you to see the sun.

*Teacher*—Look here. This is a piece of glass. (Lighting the lamp) I hold it horizontally a little, over the flame of the lamps. What do you find?

*Pupil*—The under surface of the glass is being gradually blackened!

## (2) TABLE OF MULTIPLES OF "TWO AND A HALF'S."

	১	২	৩	৪	৫	৬	৭	৮	৯	১০
২৥এ	২৥	৫	৭৥	১০	১২৥	১৫	১৭৥	২০	২২৥	২৫
	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০
২৥এ	২৭৥	৩০	৩২৥	৩৫	৩৭৥	৪০	৪২৥	৪৫	৪৭৥	৫০
	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮	২৯	৩০
২৥এ	৫২৥	৫৫	৫৭৥	৬০	৬২৥	৬৫	৬৭৥	৭০	৭২৥	৭৫
	৩১	৩২	৩৩	৩৪	৩৫	৩৬	৩৭	৩৮	৩৯	৪০
২৥এ	৭৭৥	৮০	৮২৥	৮৫	৮৭৥	৯০	৯২৥	৯৫	৯৭৥	১০০

## (3) TABLE OF MULTIPLES OF "ONE AND A FOURTH'S."

	১	২	৩	৪	৫	৬	৭	৮	৯	১০
১৥এ	১৥	২৥	৩৥	৫	৬৥	৭৥	৮৥	১০	১১৥	১২৥
	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯	২০
১৥এ	১৩৥	১৫	১৬৥	১৭৥	১৮৥	২০	২১৥	২২৥	২৩৥	২৫
	২১	২২	২৩	২৪	২৫	২৬	২৭	২৮	২৯	৩০
১৥এ	২৬৥	২৭৥	২৮৥	৩০	৩১৥	৩২৥	৩৩৥	৩৫	৩৬৥	৩৭৥
	৩১	৩২	৩৩	৩৪	৩৫	৩৬	৩৭	৩৮	৩৯	৪০
১৥এ	৩৮৥	৪০	৪১৥	৪২৥	৪৩৥	৪৫	৪৬৥	৪৭৥	৪৮৥	৫০



## CHAPTER VIII.

*Object-lessons, Writing and Arithmetic—Standard I.*

### LESSON I.

*(On the Sky.)*

**Apparatus:** A piece of rectangular glass, a small earthen lamp provided with oil and wicks, a lamp stand, and a match box.

*Teacher*—What marked difference is there between day-time and night, my dear boys?

*Pupil*—We see the sun during the day-time, but not during the night.

*Teacher*—Where is the sun to be seen?

*Pupil*—In the sky.

*Teacher*—What do you see in the sky during the night?

*Pupil*—The moon and the stars.

*Teacher*—Do you see the moon every night?

*Teacher*—How many are the stars? Can you count their number?

*Pupil*—No Sir.

*Teacher*—So we say the stars are *countless* or *innumerable*.

*Teacher*—The sun gives out very strong light which dazzles our eyes when we look at the sun. Hence we cannot see the sun well. I am going to make a contrivance however which will enable you to see the sun.

*Teacher*—Look here. This is a piece of glass. (Lighting the lamp) I hold it horizontally a little over the flame of the lamps. What do you find?

*Pupil*—The under surface of the glass is being gradually blackened!

*Teacher*—Done. A pretty thick black coating has now formed upon the under surface of the glass. Will you now look at the sun through this glass?

*Pupil*—We can see the sun very well now. It looks red just as it does when it sets! It is round like a small *thala*. Beautiful!

*Teacher*—Very good. Henceforth whenever you have to look at the sun get a piece of glass prepared this way.

*Teacher*—When you fly a kite how does the kite look as it rises higher and higher?

*Pupil*—It looks smaller and smaller.

*Teacher*—Quite so. If you stand in the middle of a large field and look at the distant objects around you how much smaller than their natural size do they appear! What do you learn from these two instances.

*Pupil*—Things appear smaller when seen from a distance.

*Teacher*—Good. You must not think then that the sun is really as small as you see it.

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## LESSON II.

(*On the Sky.*)

**Apparatus:** An orange, a piece of thread, a number of mustard grains, and some pieces of paper.

*Teacher*—Look at this orange, my boys, of what shape is it?

*Pupil*—Its shape is round.

*Teacher*—Is it round like a ball? Take it in your hands and examine it more carefully, will you?

*Pupil*—Not quite round. It is rather flat on these two sides.



*Teacher*—The Earth on which we live is like an orange in shape. Let us measure the circumference of the orange by means of this piece of thread. How long is the circumference?

*Pupil*—It is thirteen *angulis* of mine.

*Teacher*—Suppose that we measure the circumference of the earth in the same way by means of a long rope. Next imagine a road just as long as this rope. If we were to walk along this road at this rate of twentyfive miles per day, do you know what time it would take us to walk from the beginning to the end of the road? **Two years and nine months!**

*Teacher*—Would you hear next how big is the sun which appears so small? First of all do as I tell you. Take each some mustard grains and some pieces of paper. Wrap up every one hundred grains in a piece of paper. I give you ten minutes' time. Let me see who can form the greatest number of such parcels within the given time.

*Teacher*—None could do more than ten parcels! Some have done even less! How many grains are there in ten parcels?

*Pupil*—One thousand.

*Teacher*—If one thousand grains be counted in ten minutes how many can be counted in one hour?

*Pupil*—Six thousand.

*Teacher*—How many in sixteen hours then?

*Pupil*—Ninetysix thousand.

*Teacher*—Let us take it to be *one lakh* in round numbers. If *one lakh* be counted in sixteen hours what time will it take to count *a lakh and a half*?

*Pupil*—Twentyfour hours, or one day.

*Teacher*—How many will be counted in nine days then?

*Pupil*—Thirteen and a half lakhs.

*Teacher*—Good. Just imagine then what a large number *fourteen lakhs* is! Suppose you have a large heap of mustard grains before you and you go on counting the grains continually for *nine days*, doing away with food and rest! Even then you cannot hope to finish the counting of *fourteen lakhs*!

*Teacher*—I will tell you now how big the sun is. Just imagine the huge body that would be formed by putting together *fourteen lakhs of earth*! The sun is quite as huge as that!

*Teacher*—The sun is at a very great distance from the earth and hence it looks so small inspite of its large size.

---

### LESSON III.

#### (On the Sky.)

*Teacher*—You learnt the other day how big the sun is. Today I am going to give you an idea of its distance from us.

*Teacher*—Have any of you travelled by rail? Ordinarily a railway train does not go faster than 25 or 30 miles an hour. A train that goes very fast may travel 50 miles an hour.

*Teacher*—If there were a railway from the earth to the sun and if we could travel along this road in a train at the rate of 50 miles an hour without stopping for a moment, do you know what time it would take us to reach the sun? **Two hundred years!!** Just imagine then, my dear fellows, how far off is the sun from us!

*Teacher*—Will you now hear something about the moon? If we were to travel similarly from the earth to the moon we would reach the moon in *less than six months*.

*Teacher*—The earth is about as big as fortynine moons put together! The moon therefore is much smaller than



the earth. Still it is infinitely larger than the size it *appears* to possess. It looks so small only because of its great distance.

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## LESSON IV.

### (*On the Sky.*)

**Note.** This lesson is to be given partly at the time of sunrise and partly at the time of sunset.

*Teacher*—(Just at sunrise) It is a fine morning, my dear chaps. We have met together on this open ground to see the sunrise. Mark the place from which the sun appears to rise above the horizon, will you? How best can you remember this position?

*Pupil*—The sun appears to be in the direction of that mango tree and seems to rise from behind it.

*Teacher*—All right. What month is this and what day of the month is today?

*Pupil*—Today is the 10th of *Baisakh*.

*Teacher*—Look at the time-piece.

*Pupil*—It is forty minutes past five.

*Teacher*—Yes. You must all remember the observation we have made today. Similar observations will have to be made from this very place on the 10th of *Jaistha*. Let us go home now; we shall meet here again in the evening to see the sunset.

*Teacher*—(In the Evening) My good boys, will you now mark the spot at which the sun appears to set? How best to remember the spot?

*Pupil*—The sun appears now to be in the direction of that tamarind tree.

*Teacher*—What is the time now?

*Pupil*—Twenty minutes past six.

*Teacher*—All right. You noted the time of sunrise in the morning and you have just noted the time of sun-set. Will you calculate the length of today's day-time?

*Pupil*—Twelve hours and forty minutes.

*Teacher*—What will be the length of the night then?

*Pupil*—Eleven hours and twenty minutes.

*Teacher*—How much longer then is the day-time than the night?

*Pupil*—One hour and twenty minutes.

*Teacher*—Very good. The observations that we have made today from this particular place may as well be made from any other open place like this. Every one should therefore fix a place near his own house, so that he can very easily make observations of this kind whenever he likes to do so.

[The students should be made to see clearly how the positions of the sun at rising and setting change from day to day, as also the connection between these positions and the length of the day-time. Such observations should therefore be repeated as often as convenient, at least once every month, throughout the year. The 9th or 10th day of every month should be one of the selected days in that month.]

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## LESSON V.

(On the Sky.)

**Apparatus:** A stick about a cubit and a half in length, a knife, a piece of string, a piece of thread.

*Teacher*—(Taking the boys to a level piece of ground in the school compound) My dear boys, how level this piece of



ground is. Look here, I have got a stick about a cubit and a half in length. Do you know what I am going to do with it? I will fix it in the ground in a vertical position. See how I do it. What's the time by our time-piece now?

*Pupil*—It is half past six.

*Teacher*—Where is the sun?

*Pupil*—It is pretty up now.

*Teacher*—Measure the shadow of the stick, will you? Make also a scratch on the ground along the shadow from its foot to the top.

*Teacher*—(An hour later) What's the time now?

*Pupil*—It is half past seven.

*Teacher*—Will you go and measure the shadow again? Cut out a notch as before and mark also the position of the sun.

*Teacher*—What's the time now?

*Pupil*—Half past eight.

*Teacher*—Very well. Will you go to the stick once more and do exactly as you did before?

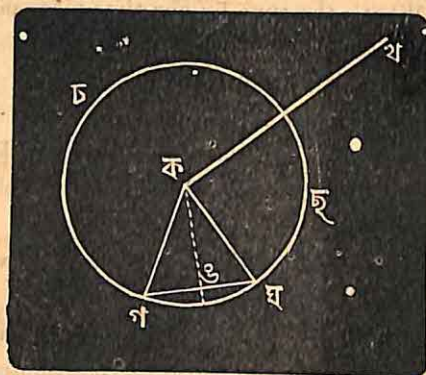
*Teacher*—You have examined the shadow three times. What have you learnt, my boys?

*Pupil*—The shadow is becoming shorter and shorter as the sun is rising higher and higher up. The position of the shadow also is gradually turning from the west towards the north.

*Teacher*—Quite so. When the sun reaches its highest position above the horizon the shadow becomes the shortest. The time when this happens is called the *midday* or the *noon*. I will shew you how to find out the length and position of the midday shadow of the stick.

[The method of determining the midday shadow of the stick: In the following diagram क ग is the stick placed vertically on the ground. क ग is its shadow some time before noon, say at about 9 o'clock.

Trace a circle on the ground with ক as centre and ক গ as radius; let গ চ হ be this circle.



In the afternoon, watch the time when the top of the shadow is once more on this circle; let ক খ be this shadow. গ ঘ is the line joining the tops of the two shadows. Determine the mid-point of গ ঘ by the aid of a piece of thread or any other way, and let উ be this point. Join ক উ. The mid-day shadow of the stick will fall upon the line ক উ.

The line ক উ also points to the North. Hence by the above contrivance we can easily determine the cardinal points at any given place.]

*Teacher*—My good lads, you can now find out yourselves the line on the ground on which the mid-day shadow of an up right stick will fall. Every one should therefore select a place in the neighbourhood of his own house and repeat this experiment from time to time. On the day of the experiment the following facts must be observed: (1) the position of the sun at rising; (2) the position of the sun at setting; (3) the length of the mid-day shadow (the length of the stick



of course remaining the same); (4) the length of the day-time. The date and results of observation should also be recorded in a note-book.

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## LESSON VI.

(*On the Sky.*)

*Teacher*—You must have all seen the full moon, my dear friends. How does it look?

*Teacher*—It is round and flat in form, and yellowish in colour.

*Teacher*—Do you see the moon every day immediately after sun set?

*Pupil*—No Sir.

*Teacher*—Very well. From this day forth you must look for the moon every evening after sun set. If you don't find it in the evening after sun set, look for it again the next morning. The results of observation must be recorded in your note-books which I propose to examine every three days.

*Teacher*—You will have to do another thing, my boys. You must also draw the shape of the bright portion of the moon as you find it at the time of observation. I want to see these drawings too.

*Teacher*—(After a month) Within the last thirty days none have seen the moon for three days, neither in the evening nor the next morning. The middle one of those three days is known as the *new-moon* day (অমাবস্যা). The day on which the moon appears completely round is called the *full moon* day (পূর্ণিমা).

*Teacher*—Henceforth you must determine the new moon and full moon days every month by observation of this kind.

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## LESSON VII.

*(On Letter writing.)*

A LETTER ADDRESSED TO MOTHER.

May God bless me.

CALCUTTA.

*1st Aghrahayana, 1308.*

To thy lily-like feet

With innumerable bows of the deepest humility are the following lines offered :—

Mamma, it is just three days since we reached this place. The journey was most delightful. I never travelled by rail before. Just imagine my delight when the train began to move. It seemed to run much faster than a horse !

The town of Calcutta is a most beautiful place. How wide and straight are the roads ! How many people live here ! Pappa took me to Chowringhee yesterday afternoon. The Chowringhee road is very wide. There is a vast *maidan* on the west of this road. The monument in the *maidan* pleased me much. It is so high ! I never saw its like before. There are many large and beautiful buildings on the east side of the Chowringhee road. So many ships in the Ganges, Mamma ! I didn't see the ships, the masts only were seen from Chowringhee. Pappa said he would take me to the river side one day and shew me the ships. We came back by tram car, which also was most pleasing to me.

How are you ? How are my little brothers and sisters ? Do they talk of me ? I will take some toys for them when we go home. Pappa says we shall be here for about a week more. Both Pappa and myself are doing well.

By your most obedient and humble servant,  
MADHU SUDAN BASU.



## LESSON VIII.

*(On Problems in Arithmetic.)*

1. I have got 27356 pice with me. If 78 beggars come and if I give the same number of pice to each, how many pice can I give to each *at most*?

The work of distribution can be performed in the following manner :—

I will take out 78 pice from the purse and give one to each ; I shall next take out 78 pice more and give one to each ; I will take out 78 pice a third time, and give one to each ; and so on.

Thus if I take out pice *three times*, each beggar will get *three pice* ; if I take out pice *four times*, each beggar will get *four pice* ; if *five times*, *five pice* ; and so on. Hence the number of pice that each beggar will get is equal to the number of times that 78 pice can be taken out of the purse.

By division we find that 78 pice can be so taken out 350 times *at most*. Hence each beggar also can have 350 pice at most.

2. If there be 356 rupees in each of seven boxes, how many rupees are there in all ? Obtain the answer by simple reasoning, and thence prove the usefulness of committing multiplication tables to memory.

We shall get the total number by adding together the numbers in the different boxes :—

356
356
356
356
356
356
356
2492

The total number in the seven boxes is thus found to be 2492.

In performing the addition we mentally proceed as follows :—  
 6 and 6, 12 ; and 6, 18 ; and 6, 24 ; and 6, 30 ; and 6, 36 ;  
 and 6, 42. Place 2 and carry 4. And so on. If the multipli-  
 cation table be committed to memory, we find out *at once* that  
 seven sixes is 42 ! In that case it is quite unnecessary for us  
 to write down 356 seven times as we have done above ;  
 the process may be shortened as follows :—

$$\begin{array}{r} 356 \\ 7 \\ \hline 2492 \end{array}$$

You see then that multiplication is but another name for  
 addition when the numbers to be added together are *all equal*.

3. A Brahmin with a number of *jaba* flowers went to per-  
 form his *poojah* at each of the four *ghats* of a tank. On  
 arrival at the northern *ghat* the number of flowers doubled,  
 and the Brahmin performed his *poojah* with 16 flowers. With  
 the remaining flowers he went to the eastern *ghat* ; as soon as  
 he went there the number of flowers doubled again ; and  
 there also the Brahmin performed his *pooja* with 16 flowers.  
 The same thing happened successively at the southern and  
 western *ghats* too. At the end of his *pooja* at the western *ghat*  
 the Brahmin had not a single flower with him ! With how  
 many flowers did the Brahmin go to the tank then ?

Evidently the Brahmin had 8 flowers only when he arrived  
 at the western *ghat*.

He had therefore  $(8 + 16)$ , or 24, flowers when he began  
 his *poojah* at the southern *ghat* ; and hence 12 flowers only  
 just before his arrival there.

He had therefore  $(12 + 16)$ , or 28, flowers when he began  
 his *poojah* at the eastern *ghat* ; and hence 14 flowers only  
 just before his arrival there.



He had therefore  $(14 + 16)$ , or 30, flowers when he began his *poojah* at the northern *ghat*; and hence 15 flowers only just before his arrival there.

Thus, the Brahmin came to the tank with 15 flowers only.

4. A number of *fakirs* and twice as many *bairagis*, came in for alms. I gave 3 pice to each *fakir* and 4 to each *bairagi*; and the total number of pice thus spent was 572. How many *fakirs* and *bairagis* had come?

Spread out as many mats as there are *fakirs*; and let them sit on the mats, one on each.

There are twice as many *bairagis* as there are *fakirs*; let then each *fakir* share his mat with two *bairagis*.

When the beggars are thus seated there will be one *fakir* and two *bairagis* on each mat.

Hence each group of beggars will get 11 pice (the *fakir* getting 3 pice and the two *bairagis*, 8 pice); whilst the whole amount spent is 572 pice. Hence the number of groups or the number of mats =  $572 \div 11 = 52$ . Hence the number of *fakirs* = 52, and the number of *bairagis* =  $52 \times 2 = \underline{104}$ .

## CHAPTER IX.

*Object-lessons, Writing and Arithmetic.—Standard II.*

### LESSON I.

( *On the Air.* )

**Apparatus:** A *malsha* of water, two earthen glasses, one earthen glass with a hole in its bottom, and an ordinary fan.

*Teacher*—Is there anything within this glass, my dear boys?

*Pupil*—Nothing Sir.

*Teacher*—The glass is not really empty as you think, my dear fellows. It is *filled* with air !

*Teacher*—We cannot see the air, but we can feel it when it moves. When we fan ourselves we set the air in motion, and we feel it. Just take this fan, will you ? and see how the air is set in motion. When the air is in motion it is called *wind*.

*Teacher*—This globe of ours is surrounded on all sides with a thick coating of air. Would you like to hear the thickness of this coating ? If we could get a straight bamboo long enough to reach the limit of the aerial coating when held vertically on the ground, do you know what would be the length of the bamboo ? **Forty miles !**

*Teacher*—What do you find within the water in this *malsha*, my boys ?

*Pupil*—An earthen glass.

*Teacher*—What is inside the glass and what is outside it ?

*Pupil*—There is water on all sides of it.

*Teacher*—So there is air on all sides of every object on the surface of the earth !

*Teacher*—Are these two earthen glasses alike ?

*Pupil*—No Sir. This one is all right, this one has got a hole in its bottom.

*Teacher*—I take the glass with a hole in its bottom and gradually dip it in water with its mouth downwards. Will you place your hand just a little above its bottom ! What do you find ?

*Pupil*—I feel a narrow stream of air coming up through the hole in the glass.

*Teacher*—Quite so. The bottom of the glass is just below the surface of water now. Let me take out the glass and put it on the table with its mouth downwards.



*Teacher*—I will take the other glass now and do the same. The bottom is just below the surface of the water now. Let me put it similarly by the side of the first glass.

*Teacher*—Will you now look at the inside of each glass?

*Pupil*—The inside of the first glass is wet up to the bottom, the bottom of the other glass is quite dry!

*Teacher*—What does this shew?

*Pupil*—Water could not reach up to the bottom of the second glass.

*Teacher*—Why so?

*Pupil*—Because there was air inside the glass.

*Teacher*—Very good, my boy. The air within the first glass was driven out through the hole and so there was nothing to prevent the water from rising up to the bottom. In the case of the other glass the air inside it could not be so driven out, and consequently water could not make its way up to the bottom.

---

## LESSON II.

(*On the Air.*)

**Apparatus:** A flag, a long flag-staff, and some instrument for digging a hole in the ground.

*Teacher*—Look around, my boys, and tell me if there is any wind now.

*Pupil*—Yes Sir, there is wind.

*Teacher*—How do you know it?

*Pupil*—The leaves of that cocoanut tree are moving, and they are certainly being moved by the wind.

*Teacher*—Which way does the wind appear to blow?

*Pupil*—Towards the south-west.

*Teacher*—Quite so. I will shew you a contrivance by which you will be able to find out the direction of the wind at all times of the day.

*Teacher*—Do you know this thing?

*Pupil*—It is a flag.

*Teacher*—Let us tie the flag at the top of this bamboo and then place the bamboo in a vertical position firmly fixed in the ground.

*Teacher*—Look, my boys. Does the flag indicate the same direction of the wind as the leaves of that cocoanut tree?

*Pupil*—Yes Sir.

*Teacher*—All right. By the aid of this flag you must determine the course of the wind from day to day and record the results of your observation in your note-books.

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### LESSON III.

( *On the Air.* )

*Teacher*—If you put a wet cloth in the sun shine what becomes of it, my boys?

*Pupil*—The cloth becomes dry.

*Teacher*—When the cloth was wet there was water in it; when it is dry it contains no water. Where goes the water then? The water turns into *vapour* which mixes with the air.

*Teacher*—Tanks and rivers dry up during certain seasons of the year. Where goes the water? It turns into *vapour*!

*Teacher*—Vapour is an invisible substance like the air and mixes with the air as soon as it comes into existence.

*Teacher*—The process of turning into vapour, which is known by the term *evaporation*, is continually going on. There must then be a very large quantity of water vapour present in the air.



*Teacher*—Wind hastens evaporation. Hence you observed this, my young friends?

*Pupil*—Yes Sir. If we hold up a piece of wet cloth in the sunshine when there is a strong wind blowing, it dries very soon.

*Teacher*—What is the proof that there is water vapour in the air? If a piece of cloth be left out in open air at night how do you find it the next morning?

*Pupil*—We find it damp.

*Teacher*—Where does the moisture come from that makes the cloth damp? It comes from the air! It is the vapour reconverted into water!

*Teacher*—Sunshine being the cause of conversion of water into vapour, its absence is the cause of the opposite process—reconversion of vapour into water. Does not the last instance shew this?

*Teacher*—In other words *heat* being the cause of conversion of water into vapour, *cold* is the cause of the opposite process—the reconversion of vapour into water.

*Teacher*—On a *cold* morning our breath looks smoky. You must have all observed this?

*Pupil*—Yes sir.

*Teacher*—How is it so? Our breath contains vapour and it is this vapour reconverted into minute particles of water that gives the smoky appearance to the breath.

*Teacher*—If you breathe upon a cold slate what happens?

*Pupil*—The slate becomes wet at the place where it is breathed upon.

*Teacher*—Where does the water come from?

*Pupil*—The vapour that comes out with the breath is turned into water.

*Teacher*—Very good.

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## LESSON IV.

(On the Surface of Lands.)

**Apparatus :** Sand, clay, water, and a few small planks each about a cubit square.

**Teacher**—Have you seen a *hill*, my young friends? I am going to make a model for you in clay.

**Teacher**—Ah! Here it is. A real hill is a thing of this shape but infinitely larger.

**Teacher**—I will make another hill by the side of this one. Don't you see there is a strip of low land between the two hills? It is a *valley*.

**Teacher**—Do we live on a hill? or have you heard of a hill or hills close by?

**Pupil**—No Sir.

**Teacher**—This part of the country then, on which we live, is neither a hill nor a valley. It is a *plain*.

**Teacher**—You have seen tanks and large ponds, haven't you? Just imagine a pond many times larger than the largest pond you have seen. Such a big pond is called a *lake*. I am now going to make a lake for you. Here it is!

**Teacher**—A *lake* then is a large field of water surrounded by land. Isn't it, my boys?

**Pupil**—Yes Sir.

**Teacher**—Just imagine now a large field of land surrounded by water. It is an *island*. Would you like to see a model of an *island*? Here it is, my young friends?

**Teacher**—I am now going to make a model of something. I won't tell you what I am about. Done! What is it that I have made a model of, my friends?

**Pupil**—It is a river!

**Teacher**—Very good.



## LESSON V.

(On Writing.)

PATTAH.

Matlal Ghose.

To Mafez Mandal, son of Naimaddi Mandal, by caste a Mahomedan, by profession a cultivator, inhabitant of Village Byaspur, Pergunnah Mahamud Shahi, District Jessore, Police Station and Sub-Registry office at Sailkopa.

Written by Mati Lal Ghosh, son of the late Babu Nilkamal Ghosh, by caste a Kayastha, by profession a *Talukdar* and a money lender, inhabitant of Sadhuhati, Pergunnah Mahamud Shahi, District Jessore, Police Station and Sub-Registry office at Sailkopa—this auspicious deed of a temporary *Pattah*. By right of inheritance I am the sole possessor of the *taluk* numbered 3264 in the records of the Jessore-Collectorate. There is a plot of land measuring about one and a half *bighas*, fit for the cultivation of paddy, situated in your own village within the following boundaries and included within the aforesaid *taluk*. On your having applied to me for a temporary lease of this plot of ground for the purpose of cultivation, I agree to your proposal and grant you a lease for 8 years from the month of Baisakh 1308 to the month of Chaitra 1315, on a net yearly rent of Rupees 1-14 (one rupee and fourteen annas only). The above rent together with the amounts of Road Cess, Public Work Cess and any other cess that in future may come in force, is to be paid by instalments as soon as they are due in accordance with the custom in vogue. If any instalment be not paid in time you shall have to pay interest upon it from the date that it is due at the rate of Rupees 12 per annum. If on survey the land is found to be larger in area than that stated in this document the rent shall be proportionately increased. No objection to pay the rent on the ground of draught or

flood shall be heard. You shall not give up the land within the term of the lease nor shall I eject you within the said time. On these terms and on the receipt of a *Kabulyat* from you I give you this *Pattah*. Dated the 10th of *Baisakh*, 1308.

Boundaries of the land.

On the west of the public road, on the north of the *Jama* land of Sukur Mahamad Saikh deceased, on the east of the *Jote* land of Kalimaddi Mandal and on the south of the *Mantran* land of Baburam Biswas deceased. One plot of land fit for tillage.

*One and a half bighas only.*

Witnesses.

Copied by  
Bhriguram Das,  
of Nityanandapur.

Gouri Kanta Chakravarti,  
of Gopalpur.

---

A *Kabulyat* is only the counterpart of a *Pattah*. The terms are the same, the only difference being that the *Kabulyat* is addressed by the tenant to the landlord whereas the *Pattah* is addressed by the landlord to the tenant. The teacher will have no difficulty then to teach the pupils how to write out a *Kabulyat*.

Printed forms of *dakhilas* or rent receipts are also available everywhere. The teacher should bring in a form and explain to his pupils the method of filling it up.

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## LESSON VI.

*(On Problems in Arithmetic.)*

1. There are 93 children in boys and girls. If I give 14 annas 9 pies to each boy and 9 annas 3 pies to each girl I have to spend 73 rupees 3 pies in all. How many are the boys and how many, the girls?

14 Annas 9 pies exceeds 9 annas 3 pies by 5 annas 6 pies.  
Hence each boy gets 5 annas 6 pies more than each girl.

Suppose we take back from each boy 5 annas 6 pies; then each child, whether a boy or a girl, will have 9 annas 3 pies.

Hence the total amount with the children

$$\begin{aligned} &= (9 \text{ annas } 3 \text{ pies}) \times 93 \\ &= (\text{Rs. } 46 \text{ annas } 8) + (\text{Rs. } 5 \text{ as. } 13) + (\text{Re. } 1 \text{ as. } 7 \text{ pies } 3) \\ &= \text{Rs. } 53 \text{ as. } 12 \text{ pies } 3. \end{aligned}$$

Hence the amount taken back from the boys

$$\begin{aligned} &= (\text{Rs. } 73 \text{ pies } 3) - (\text{Rs. } 53 \text{ as. } 12 \text{ pies } 3) \\ &= \text{Rs. } 19 \text{ as. } 4; \end{aligned}$$

whilst the amount taken from each = as. 5 pies 6.

Clearly therefore the number of boys is equal to the number of times that 5 annas 6 pies is contained in Rs. 19 as. 4.

$$\begin{array}{l} \text{Rs. } 19 \text{ as. } 4 = 308 \text{ annas} = 1232 \text{ pice} \} \\ \quad \quad \quad 5 \text{ annas } 6 \text{ pies} = 22 \text{ pice} \} \end{array}$$

$$\begin{array}{l} \text{Hence the number of boys} = 1232 \div 22 = \underline{56} \} \\ \text{and } \therefore \text{the number of girls} = 93 - 56 = \underline{37}. \} \end{array}$$

2. A *Mollah* had visited five mosques in succession. As soon as he arrived at the first mosque his purse increased *five fold* and he spent Rs. 97 as. 10 pies 6 in worship. With the remainder he went to the second mosque, as soon as he arrived there his purse again increased *five fold*, and he spent the same amount, viz., Rs. 97 as. 10 pies 6 in worship. The

same thing happened successively at the 3rd, 4th and 5th mosques. But after his worship in the 5th mosque nothing remained. Will you find out the amount that the *Mollah* had with him just before his arrival at the first mosque?

It is clear that just *before the Mollah's* arrival at the *fifth* mosque he had with him (Rs. 97 as. 10 pies 6)  $\div 5$ , i.e. Rs. 19 as. 8 pies 6. Hence the amount that he had *after* his arrival at the *fourth* mosque

$$= (\text{Rs. } 19 \text{ as. } 8 \text{ pies } 6) + (\text{Rs. } 97 \text{ as. } 10 \text{ pies } 6) \\ = \text{Rupees } 117 \text{ as. } 3.$$

Hence the amount that he had immediately *before* his arrival at the *fourth* mosque was (Rs. 117 as. 3)  $\div 5$  or Rs. 23 as. 7. Hence the amount that he had *after* his arrival at the *third* mosque = (Rs. 23 as. 7) + (Rs. 97 as. 10 pies 6)

$$= \text{Rs. } 121 \text{ a. } 1 \text{ pies } 6..$$

Clearly therefore the amount that he had immediately *before* his arrival at the *third* mosque was (Rs. 121 as. 1 pies 6)  $\div 5$  or Rs. 24 as. 3 pies 6. Hence the amount that he had *after* his arrival at the *second* mosque

$$= (\text{Rs. } 24 \text{ as. } 3 \text{ pies } 6) + (\text{Rs. } 97 \text{ as. } 10 \text{ pies } 6) \\ = \text{Rs. } 121 \text{ as. } 14.$$

Clearly therefore the amount that he had *before* his arrival at the *second* mosque was (Rs. 121 as. 14)  $\div 5$  or Rs. 24 as. 6. Hence the amount that he had *after* his arrival at the *first* mosque = (Rs. 24 as. 6) + (Rs. 97 as. 10 pies 6) = Rs. 122 pies 6.

Clearly therefore the amount that he had immediately *before* his arrival at the *first* mosque was (Rs. 122 pies 6)  $\div 5$  or Rs. 24 as. 6 pies 6.

Hence the required answer

$$= \underline{\text{Rs. } 24 \text{ as. } 6 \text{ pies } 6.}$$



3. If the 30th of December 1896 be a Wednesday what day of the week was the 9th of February 1874?

We have to leave out all the weeks from 9th of February 1874 to the 30th of December 1896, and take only the remaining odd days. The first of these odd days will be the same day of the week as the 9th of February 1874—the day from which the weeks are counted.

An ordinary year consists of 52 weeks and 1 day, whereas a leap year contains 52 weeks and 2 days. Hence, leaving out the weeks, we have to take one day for every ordinary year and 2 days for every leap year. On the same principle for every month of 29 days we have to take 1 day; for every month of 30 days, 2 days; and for every month of 31 days, 3 days.

It is 22 years from the 9th of February 1874 to the 8th of February 1896. Of the first twenty of these 22 years 5 are leap years; of the last two years none is a leap year. Hence the total number of leap years within these 22 years is 5.

Hence the number of days that we have to count within these 22 years =  $22 + 5 = 27$ ; leaving out 3 weeks we have 6 days only.

There are 21 days from the 9th of February 1896 to the 29th of the same month. These days therefore are to be left out of account.

Let us now see how many days we get from the 1st March to the 30th December 1896:—

3 days of March and 2 of April, 5 days; and 3 days of May, 8 days; leaving out 7 we have 1. One day and 2 days of June, 3 days; and 3 days of July, 6; and 3 days of August, 9 days; leaving out 7 we have 2. Two days and 2 days of September, 4 days; and 3 days of October, 7 days; leaving out 7 we have nothing. Two days of November and 2 days of December, 4 days.

Thus we have to take 6 days only up to 8th February 1896, and 4 days only from the 9th February to the 30th December, 1896. 6 and 4, 10; leaving out 7 we have 3.

It is clear therefore that leaving out the weeks during the given period we get as remainder 3 *days only*.

Of these three days the last is a Wednesday; hence the first must be a Monday.

Hence the 9th February 1874 was a Monday.

## CHAPTER X.

### *Methods of teaching particular subjects.*

1. **Reading.** The pronunciation of each word must be clear and distinct. Reading in a sing-song or any other unnatural tone as also reading too fast should be altogether discouraged. At the end of a sentence the breath must be stopped completely as if there were nothing else after it; still the stoppage must not continue for more than 2 or 3 seconds. A good reading invariably makes clear the meaning of the thing read. These are some of the chief points that the teacher should always have in view in teaching the art of reading.

2. **Handwriting.** No letter should be written imperfectly. All the letters must be of the same size. There must be sufficient space between every two words, and sufficient space between every two lines. It is not advisable to write a part of a word in one line and the next part in the next line; this should be avoided as much as possible. The lines must be straight and the words must be spelt correctly. The teacher should first shew specimens of good writing on the board and then ask his pupils to imitate the method to the best of their abilities. The pupils should be



asked now and then to come to the board one by one and write out the same thing, each student writing out his line just below that of his predecessor. This will enable the teacher to compare their writings and bring the defects to the notice of all.

3. **Dictation.** As much of a sentence should be dictated at a time as the students can well remember and write out. The number of words that should be dictated together would depend not only upon the general capabilities of the students but also upon the previous training they had received in this direction. In no case should the words be *repeated* and no student should be allowed to *say any thing* whilst writing out the dictation. After giving the students reasonable time for writing out the group of words dictated, the teacher should proceed to the next group of words exactly the same way ; and so on. After the students have finished writing they should revise what they have written before they give in their slates. The teacher should then examine the slates and point out clearly to each student the mistakes that he has made.

4. **Arithmetic.** At the commencement of each subject the student's interest in it should be excited by all means. The outward appearance of the subject should be made as attractive as possible, so that the student may be tempted to approach it with all the cheerfulness of a sprightly child.

Mental calculation should be considerably encouraged. In every subject the smaller sums should be invariably done mentally. This will give a sound *practical training* to the intellect of the student.

In every text-book on Arithmetic solutions of various types are given. The students should be made to go through these solutions and try to understand them with unaided exertion. This will greatly help in initiating the student into the art of accurate and methodical reasoning. It is not unoften that

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this part of a student's training is altogether left out of consideration.

When the boys of any class are given a sum to work out, one of them should work it out on the back side of the board and the others on their slates. After everybody has finished his work, the teacher should turn round the board and present the solution on the other side of it before all the students. He should first of all discuss the merits of the solution on the board and then look into the slates.

The number of sums forming the home exercise should not exceed 4 or 5 at a time. If they are more than that, many of the students will not be able to do all the sums satisfactorily, and consequently their interest in the subject will flag.

**5. Object-lessons.** Specimens of such lessons have been copiously given in previous chapters of this book. It is not necessary therefore to say much about them here. Teaching by object-lessons is preferable to every other method, in as much as it enables the student to exercise his own powers of observation. "The doll has eyes but it cannot see." So runs a memorable passage in the well known work entitled *Bodhodaya* by the late venerable Pandit Vidyasagar. The aim of object-lesson teaching is to "open up" the eyes of the child, and prevent the "doll" as much as possible from instilling its hopeless inertia into the mind of its possessor.

**6. The Science Reader.** Botany, Natural History, Agriculture, Physics, Chemistry, Hygiene and Domestic Economy, form the subject matter of this book. The student should receive a practical training in the elements of each of these subjects. Mere book learning is of little value. Each of these subjects therefore should be illustrated as much as possible by object-lessons.

As to the principles of Hygiene and Domestic Economy it will not be enough for the student to have a mere knowledge



- of them. He must learn to apply this knowledge in practice. It will be the duty of the teacher to have a vigilant eye upon the habits and doings of his pupils, and see if they practically carry out the instructions they receive from the book.
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## CHAPTER XI.

*Qualifications and duties of a good teacher, and his conduct towards his pupils.*

### 1. A constant desire for improving himself.

No one can do any thing well unless he has a mind to do it well. This is a most general proposition and a *truism*. No one therefore can do the work of teaching satisfactorily, far less excel in it, unless he has the mind to do so. Of the many arts, the art of teaching is a most difficult one ; it is all the more necessary therefore that a person should take to it with all the ardour of an enthusiast. If the students fail to appreciate the lesson given them the teacher should not think that it is they alone that are to blame for it ; he should think for a moment if it is not due to any fault of his own. Gradual improvement of his own manner and ways as well as of the stock of his own knowledge should be the aim of every good teacher.

### 2. Vivacity and cheerfulness.

This is one of the chief qualifications of a good teacher, and, in fact, a *sine qua non* for a teacher of children. Life and cheerfulness in the teacher induce similar conditions in the pupil, and the latter, as a consequence, finds himself quite at ease. There is no denying the fact that the child will be the better able to

apply himself to his work when he is in good spirits than when not. On the contrary, if the children find the teacher gloomy and morose, a feeling of pain and trouble pervades them ; and, as a consequence, they fail to pay that amount of attention to their work which they might otherwise have done.

3. **Evenness of temper.** Neither the work of teaching nor that of maintaining discipline can be successfully performed if the teacher fails to keep his own temper under proper control. If the student is slow to understand a thing the teacher should not get angry and scold him, but see how best to make the thing clearer. Scolding in such a case produces just the opposite effect. It serves only to stupefy the child all the more. If the child, out of his natural levity, does any thing which the teacher does not like, just imagine the scene of the teacher giving the child a slap after slap on his cheek and the poor urchin crying aloud with his mouth wide open ! Such a course defeats its own object and serves only to render the child more callous. The right course would be to explain to the child the real nature of his shortcoming and persuade him in a spirit of sympathy to behave better in future.

4. **Sympathy and Justice.** Even when a child does an act which is wrong on the very face of it he should not be punished at once—*condemned unheard*. The clear duty of the teacher is to ascertain the cause of the act, to see how far the child was guilty and how far not. If the child is found guilty, explain to him clearly the nature of his guilt before punishing him. If the act has been caused by circumstances over which the child had no control, don't be wanting in sympathy for him, but explain to him in a spirit of love how best he could avoid it. This is justice. In no



case should the child be given an opportunity to feel that an injustice is being done to him. Such a feeling not only renders the child unhappy but at the same time undermines his regard for the teacher.

**5. Vigilance.** This is an indispensable means for keeping up discipline. The place in the school room that has been assigned to the teacher in chapter IV. of this book will be found most suitable for keeping an eye upon all the pupils at the same time. Every student should be made to feel that the sharp eye of the teacher is constantly upon him, and that every little act of wickedness is sure to come to his notice. Such a feeling will do more to keep the student from wrong doing than any amount of punishment.

**6. Punctuality.** The teacher should invariably come to school and leave it in right time. If the school hours are timed to commence at 11 o'clock and close at 4, let the teacher come precisely at 11 and leave it precisely at 4. The timing should not be a mere matter of form. If he comes late the students will not only find his absence a fit occasion for misbehaving themselves, but they will gradually begin to follow his example; the consequence will be that even on those days on which the teacher comes in right time many of the students will not. If he leaves the school late, the students will grow impatient and consequently inattentive. Such detention will cause them both physical and mental hardship and is sure to tell upon their health if frequently repeated. The daily routine of business should be scrupulously followed. It will not do to go on teaching one class beyond the prescribed time, to the detriment of others. The teacher should always guard himself against an error of this kind. The example of the teacher will be far more effective in imbuing the mind of the pupil with the value and right use of time than any amount of lecturing.

Where the example and precept do not agree the result is simply disastrous.

7. **Conduct towards the pupils.** The teacher should by his manner and acts let his pupils always feel that he is a great friend and well-wisher of theirs. He is to conquer them by love and not by fear. Once they know how dearly he loves them, nothing will be further from their mind than the idea of incurring his displeasure.

The teacher should be candid and sincere in his dealings with his pupils. If he hasn't himself got a clear idea of a subject he should by no means pretend to know it well, and attempt to mystify the pupil in various ways.

If in any particular instance the student happens to exhibit better intelligence than the teacher, the latter should under no circumstances smart under a sense of defeat. On the other hand he should enjoy the occasion and give the student credit for what he has said or done. Extremes however should always be avoided. Undue praise is just as objectionable as undue blame. The former makes the student self-sufficient and over-confident whilst the latter damps his spirit.

The teacher should be scrupulously honest, straight forward and truthful in his dealings with his pupils. Moral lessons inculcated upon the students will be simply useless if they find the teacher doing in practice the very opposite of what he preaches.

8. **Discipline.** The best way to maintain school discipline is to keep the students engaged somehow or other. If the work assigned be one in which they take a particular interest, matters will go on most smoothly. Occasions however will arise in which it will be necessary to award punishment. The degree of punishment should invariably be determined by the nature of the offence committed. A set of



rules should be framed by the teacher assigning different forms of punishment for different offences. This set of rules may be called the teacher's "Penal Code". He should always guide himself by this code and let his pupils understand in words as well as in action that the laws of the code are as inviolable as the laws of nature. Care and judgment should be adequately exercised when the rules are drawn up, so that no difficulty may afterwards arise in the practical working of them. But when the code is once declared to be in force there should be no relaxation whatever in its practical application. The students will learn to be careful when they know for certain how inevitable the working of the code is. The teacher should be always just and impartial either in deciding cases of dispute between one student and another or in awarding punishment. Stern justice and impartiality are the main-stay of every system of discipline that has any pretension to soundness.

9. **Corporal punishment.** Any form of corporal punishment which is likely to cause bodily injury of any kind or to interfere with the natural laws of health should be altogether abolished. Pulling by the hair, slapping on the back, and striking on the palm with a cane are about the only forms of corporal punishment that should find a place in the teacher's "Penal Code". All forms of corporal punishment however, as a rule, should be used sparingly. Fear of punishment is by far a stronger deterrent than punishment itself; the teacher should always bear this truism in mind.

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## CHAPTER XII.

### *Action Songs.*

#### SONG I.

#### *(The Mango Stone.)*

1. { The mango stone, the mango stone, the mango stone !  
    { The beautiful mango stone !
2. Let us plant them in the ground ho !
3. Water the soil now, water the soil ;
4. The sprout has come out, look, look, look !
5. Let us water again and again and again.
6. Look at the tree now, what a big tree !
7. The branches are its arms, the leaves its hair !
8. A big tree out of a stone, a small stone ;
9. Wonderful, wonderful, O wonderful !

#### **Actions.**

1. The children are to stand up in two rows facing each other ; each child is to hold up a mango stone and make the action of shewing it to the children of the opposite row.
  2. Each child is to make the action of planting a seed in the ground.
  3. The action of pouring water from a *lotah*.
  4. Each child is to bend over the supposed position of the seed as if looking at the sprout.
  5. The action of watering a plant.
  6. Each child to stand up and make the action of pointing to a tree and shewing its bigness by outstretching the arms.
  7. Arms to be outstretched and then the hair to be touched by bending the head a little to the right.
  8. Once to outstretch the arms and again to shew the smallness of the stone by putting together the tips of the thumb, the forefinger and the middle finger.
  9. To look up at the sky with the arms half lifted.
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## SONG II.

*(The Cat and Mice.)*

1. Let us fly, let us fly, there he is.
2. { Where are they gone, I don't see them now !  
I must lie in wait here to see if they come.
3. { We are not cowards, we are not cowards !  
Let us go and face the cat.
4. O run, run, run, he is there, don't you see ?
5. Curse me, the fellows have gone away again ;
6. Can't you get me a bell, my friends ?
7. { Yes, yes, yes, that is a good idea.  
We'll put it on the neck of that wicked fellow ;  
No more fear, no more fear,  
The bell will tell us when he comes.
8. But how are we to bell the cat ?
9. O there lies the rub, there lies the rub.

## Actions.

1. One of the children will be the cat and the others, the mice. The mice on seeing the cat coming will run away.
2. On seeing the mice disappear the cat is to be in wait for them, and this part of the song is to be sung by the cat alone.
3. The mice will sing this, shew bravery and come to meet the cat.
4. The mice will sing this and run away again, trembling with fear.
5. The cat is to express his disappointment.
6. One of the mice alone is to sing this line addressing his comrades.
7. The mice will sing these lines in exultation.
8. The oldest mouse to put this question in all earnestness.
9. All the mice expressing sorrow and disappointment by holding their heads with their hands.

## SONG III.

*(Horses and Elephants.)*

The children are to stand up in two rows facing each other. One row to represent horses and other, elephants.

1. Look at our trunks, my friends ;
2. Look at our trunks, how long !
3. Look at our trunks, how high they can rise !
4. Look at our trunks, what a big circle they make !
5. Will you see now how we walk ?  
Beautiful, O elephant friends, beautiful.
6. { It is your turn now to look at us,  
    { O elephant friends, will you look at us ?
7. No trunks have we, no trees can we break.
8. Nor are we so high as you are.
9. But our bodies are light, whilst yours are heavy,
10. And see how we run !

## Actions.

1. The right arm of each child is to represent the trunk.
  2. The right arm to be stretched out in front.
  3. The right arm to be lifted up.
  4. The right arm to be stretched out and moved from right to left and left to right.
  5. To walk with the body half bent, the right arm hanging down and moving backwards and forwards.
  6. The horses to point to their own bodies whilst addressing the elephants.
  7. To make the action of breaking a tree with the trunk whilst nodding the head to shew that this is what they cannot do.
  8. To lift up the right arms and nod the head.
  9. To shew by the hands and arm a light thing which can be held up and a big heap, in succession.
  10. To run like horses.
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## SONG IV.

*(Sowing Paddy).*

The children are to stand up in a circle and gradually move round and round along the circle as they sing.

1. { Let us plough the paddy field, let us plough it first,  
Good ploughing good harvest we all know ;  
Plough therefore my good friends plough,  
As completely as possible, let us plough.
2. { The harrow now, the good harrow,  
To break the soil after ploughing.
3. { Ploughing and harrowing we have finished both.  
What a delight, my friends, what a delight !
4. { The seeds now, the seeds now, the seeds now.  
Let's hold the seeds in our left hands,  
And sow on and on and on ;
5. Finished ; let us clap our hands and go.

## Actions.

1. To make the action of ploughing ; as if holding the handle of the plough with the left hand and driving the bullocks by the right.
2. To imitate the act of harrowing in the same manner.
3. To move round clapping hands.
4. To make the action of sowing seeds.
5. To move round twice or thrice, clapping hands while singing.

**Note.** The above are only a few specimens of the kind of songs that will best suit the children. It will not be difficult for the teacher to get up as many songs of this nature as he likes for his pupils.

